SEARCH REQUEST FORM

Requestor's Name: Joseph D. Anthony

Serial Number: 09/786,719

Date: 02/23/03

Phone: 308-0446

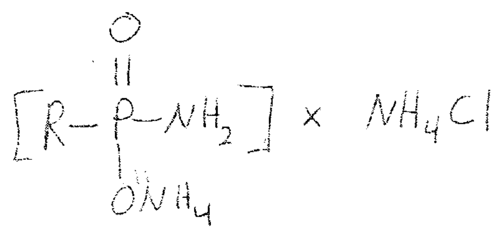
Art Unit: 1714

CP3-4D05 (Room)

Search Topic:

Please write a detailed statement of search topic. Describe specifically as possible the subject matter to be searched. Define any terms that may have a special meaning. Give examples or relevant citations, authors keywords, etc., if known. For sequences, please attach a copy of the sequence. You may include a copy of the broadest and/or most relevant claim(s).

(1) Please do a structure search for the following Formula (I).



Where R is an alkyl radical having 1 to 3 carbon atoms. Such structures are complex compounds of ammonia salt of amide of alkylphosphonic acid with ammonium chloride.

(2) Please also search the complex compounds of Formula (I) that have been microencapsulated in a polymeric shell, wherein the polymer is preferably polyethylene or a polyorganosiloxane, such as polyvinylmethyldiethoxysiloxane and polyaminopropylethoxysiloxane.

(3) The complex compounds either alone or preferably microencapsulated are used as flame or combustion retardants for polymeric materials. Claimed polymeric materials are polyethylene, polypropylene, polystyrene, polymethyl methacrylate, polycaproamide, synthetic rubbers etc.

Thanks,

PCT/RU99/00073 0446 Joe Anthony

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Date completed:	**Search Site**	**Vendors**
Searcher:	STIC	IG Suite
Terminal time:	CM-1	STN
Elapsed time:	Pre-S	Dialog
CPU time:	**Type of Search**	APS
Total time:	N.A. Sequence	Geninfo
Number of Searches:	A.A. Sequence	SDC
Number of Databases:	Structure	DARC/Questel

Joseph,

There were not many compounds that fit your formula. I didn't find many compounds that had the P=O, where the NH2 and OH are bonded to the P.

The way your compound is normally indexed is the ONH4 is an OH and the salt NH4 etc. is a separate structure.

I modified your results with text searching - for the polymers and fireproofing and also obtained registry numbers for polyethylene, polystyrene etc. and combined with the results from your structure search.

If you have any questions please call me.

John

=> file reg

FILE 'REGISTRY' ENTERED AT 15:48:07 ON 25 FEB 2003
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
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Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 24 FEB 2003 HIGHEST RN 494745-03-8
DICTIONARY FILE UPDATES: 24 FEB 2003 HIGHEST RN 494745-03-8

TSCA INFORMATION NOW CURRENT THROUGH MAY 20, 2002

Please note that search-term pricing does apply when conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

=> d his nofile

(FILE 'HOME' ENTERED AT 14:09:49 ON 25 FEB 2003)

FILE 'LREGISTRY' ENTERED AT 14:09:58 ON 25 FEB 2003
L1 STR
L2 STR L1
L3 STR L2
L4 STR L3

FILE 'REGISTRY' ENTERED AT 14:12:54 ON 25 FEB 2003
L5 50 SEA SSS SAM L1
L6 50 SEA SSS SAM L2
L7 50 SEA SSS SAM L3
L8 50 SEA SSS SAM L4

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     FILE 'LREGISTRY' ENTERED AT 14:13:27 ON 25 FEB 2003
                D QUE STAT L1
                D QUE STAT L5
                D QUE STAT L6
                D QUE STAT L7
                D QUE STAT L4
                D QUE STAT L8

     FILE 'REGISTRY' ENTERED AT 14:50:43 ON 25 FEB 2003
L9            50 SEA SSS SAM L2
L10              SCR 1918
L11           50 SEA SSS SAM L2 NOT L10
L12        69591 SEA SSS FUL L2 NOT L10
L13        17857 SEA ABB=ON  PLU=ON  L12 NOT 0-20/NR
                D QUE STAT L12
                D QUE STAT L3
                D QUE STAT L1
L14             STR L1
L15           50 SEA SUB=L13 SSS SAM L14
L16        17238 SEA ABB=ON  PLU=ON  L13 NOT 21-100/NR
L17           50 SEA SUB=L16 SSS SAM L14
L18              STR L14
L19           50 SEA SUB=L16 SSS SAM L18

     FILE 'LREGISTRY' ENTERED AT 15:00:33 ON 25 FEB 2003
                D QUE STAT L19
L20             STR L18
L21             STR L20

     FILE 'REGISTRY' ENTERED AT 15:03:07 ON 25 FEB 2003
L22           50 SEA SUB=L16 SSS SAM L20

     FILE 'LREGISTRY' ENTERED AT 15:05:27 ON 25 FEB 2003
                D QUE STAT L22
L23             STR L20

     FILE 'REGISTRY' ENTERED AT 15:12:55 ON 25 FEB 2003
L24           50 SEA SUB=L16 SSS SAM L23
L25         2687 SEA SUB=L16 SSS FUL L23
                SAVE ANTH719A/A L25
                D SAVED
                DELETE SELLER032/A
                SAVE L16 ANTH719/A
L26         2162 SEA ABB=ON  PLU=ON  L25 NOT (0-5/S OR 0-5/SI)
L27          151 SEA ABB=ON  PLU=ON  L26 AND ?HYDROXY?/CNS
                E 14500-78-8/RN
L28            1 SEA ABB=ON  PLU=ON  14500-78-8/RN

     FILE 'HCA' ENTERED AT 15:22:08 ON 25 FEB 2003
L29        24470 SEA ABB=ON  PLU=ON  L16
L30         1454 SEA ABB=ON  PLU=ON  L26
L31           71 SEA ABB=ON  PLU=ON  L27
L32           20 SEA ABB=ON  PLU=ON  L28/D
                D SCAN
L33            2 SEA ABB=ON  PLU=ON  L28/D(L)(ALKYL? OR METHYL? OR ETHYL? OR ET
                OR ME OR PROPYL? OR PR OR C)
                D SCAN

     FILE 'REGISTRY' ENTERED AT 15:26:12 ON 25 FEB 2003
```

```
                E POLYETHYLENE/CN
L34           1 SEA ABB=ON  PLU=ON  POLYETHYLENE/CN
                E POLYSILOXANE/CN
L35           1 SEA ABB=ON  PLU=ON  POLYORGANOSILOXANE/CN
                D SCAN
                E POLYSTYRENE/CN
L36           1 SEA ABB=ON  PLU=ON  POLYSTYRENE/CN
                E METHACRYLATE/CN
L37           1 SEA ABB=ON  PLU=ON  METHACRYLATE/CN

     FILE 'HCA' ENTERED AT 15:27:52 ON 25 FEB 2003
L38      151407 SEA ABB=ON  PLU=ON  L34
L39         106 SEA ABB=ON  PLU=ON  L35
L40       90778 SEA ABB=ON  PLU=ON  L36
L41         277 SEA ABB=ON  PLU=ON  L37

     FILE 'REGISTRY' ENTERED AT 15:28:13 ON 25 FEB 2003
                E POLYMETHACRYLATE/CN

     FILE 'HCA' ENTERED AT 15:28:34 ON 25 FEB 2003
L42      227965 SEA ABB=ON  PLU=ON  L38 OR L39 OR L40 OR L41
L43      698630 SEA ABB=ON  PLU=ON  POLYETHYLENE? OR POLYORGANOSILOXANE? OR
                POLYSTYRENE? OR RUBBER?
L44      718352 SEA ABB=ON  PLU=ON  L42 OR L43
L45          27 SEA ABB=ON  PLU=ON  L26 AND L43
L46           0 SEA ABB=ON  PLU=ON  L31 AND L43

     FILE 'LCA' ENTERED AT 15:30:44 ON 25 FEB 2003
L47        1494 SEA ABB=ON  PLU=ON  COMBUST? OR IGNIT? OR FIRE? OR FLAME? OR
                BURN#####
L48       14808 SEA ABB=ON  PLU=ON  INHIBIT? OR HINDER? OR IMPED? OR ARREST?
                OR REDUC? OR REDN# OR RESIST? OR SUPPRESS? OR RETARD? OR
                PROHIBIT? OR PREVENT? OR BLOCK? OR ELIMINAT?
L49         240 SEA ABB=ON  PLU=ON  L47(3A)L48 OR FIRERESISTENT? OR FIREPROOF?
                OR FIRERETARD? OR COMBUSTIONRESIST?

     FILE 'HCA' ENTERED AT 15:34:01 ON 25 FEB 2003
L50       83920 SEA ABB=ON  PLU=ON  L47(3A)L48 OR FIRERESISTENT? OR FIREPROOF?
                OR FIRERETARD? OR COMBUSTIONRESIST?
L51          11 SEA ABB=ON  PLU=ON  L45 AND L50
L52          63 SEA ABB=ON  PLU=ON  L30 AND L50
L53           2 SEA ABB=ON  PLU=ON  L31 AND L50

     FILE 'REGISTRY' ENTERED AT 15:35:10 ON 25 FEB 2003
L54           9 SEA ABB=ON  PLU=ON  L16 AND NH4
L55           0 SEA ABB=ON  PLU=ON  L16 AND HCL
L56        5840 SEA ABB=ON  PLU=ON  L16 AND X/ELS
L57        4323 SEA ABB=ON  PLU=ON  L16 AND CL/ELS
                D SCAN L54

     FILE 'HCA' ENTERED AT 15:37:39 ON 25 FEB 2003
L58          46 SEA ABB=ON  PLU=ON  L54
L59           0 SEA ABB=ON  PLU=ON  L58 AND L44
L60           2 SEA ABB=ON  PLU=ON  L58 AND L50
                D SCAN
L61          27 SEA ABB=ON  PLU=ON  L26 AND L44
L62          13 SEA ABB=ON  PLU=ON  L51 OR L60
L63          16 SEA ABB=ON  PLU=ON  L45 NOT L62
L64     1931516 SEA ABB=ON  PLU=ON  POLYMER## OR HOMOPOLYMER## OR COPOLYMER##
                OR TERPOLYMER## OR RESIN? OR GUM? OR IONOMER?
```

```
L65             9 SEA ABB=ON  PLU=ON  L63 AND L64
L66            16 SEA ABB=ON  PLU=ON  L65 OR L63
L67            10 SEA ABB=ON  PLU=ON  L62 AND L64
L68            13 SEA ABB=ON  PLU=ON  L62 OR L67

     FILE 'LCA' ENTERED AT 15:43:32 ON 25 FEB 2003
L69           230 SEA ABB=ON  PLU=ON  ENCAPSULAT? OR MICROENCAPSULAT? OR
                  MICRO(A)ENCAPSULAT? OR ENCAS? OR ENWRAP? OR SHEATH? OR JACKET?

     FILE 'HCA' ENTERED AT 15:44:56 ON 25 FEB 2003
L70         89949 SEA ABB=ON  PLU=ON  ENCAPSULAT? OR MICROENCAPSULAT? OR
                  MICRO(A)ENCAPSULAT? OR ENCAS? OR ENWRAP? OR SHEATH? OR JACKET?
L71             8 SEA ABB=ON  PLU=ON  (L66 OR L68) AND L70
L72             8 SEA ABB=ON  PLU=ON  L61 AND L69
L73            29 SEA ABB=ON  PLU=ON  L66 OR L68 OR L71 OR L72

     FILE 'REGISTRY' ENTERED AT 15:48:07 ON 25 FEB 2003


=> d que stat L25                                  => 26837 hits in registry file.
L2                STR
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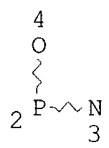

parent

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NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   3

STEREO ATTRIBUTES: NONE
L10               SCR 1918
L12         69591 SEA FILE=REGISTRY SSS FUL L2 NOT L10
L13         17857 SEA FILE=REGISTRY ABB=ON  PLU=ON  L12 NOT 0-20/NR
L16         17238 SEA FILE=REGISTRY ABB=ON  PLU=ON  L13 NOT 21-100/NR
L23               STR
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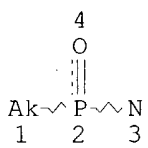

Subset / Substructure.

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NODE ATTRIBUTES:
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GGCAT   IS LOC  AT   1
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   4

STEREO ATTRIBUTES: NONE
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L25 2687 SEA FILE=REGISTRY SUB=L16 SSS FUL L23

100.0% PROCESSED 17238 ITERATIONS 2687 ANSWERS
SEARCH TIME: 00.00.01

=> file hca

FILE 'HCA' ENTERED AT 15:49:44 ON 25 FEB 2003
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PLEASE SEE "HELP USAGETERMS" FOR DETAILS.

FILE COVERS 1907 - 20 Feb 2003 VOL 138 ISS 9
FILE LAST UPDATED: 20 Feb 2003 (20030220/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

**********Joseph, this first record is the author's. Notice that the compound you wanted searched is indexed (in the IT field) as Phosphonamidic acid, C1-3 alkyl, which is why I used L33 to find similar compds.

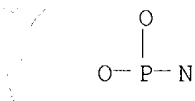
=> d L33 1-2 cbib abs hitind hitstr

L33 ANSWER 1 OF 2 HCA COPYRIGHT 2003 ACS
132:208728 Fire retardant for polymeric materials and its use. Zubkova, Nina Sergeevna; Butylkina, Nataliya Grigorievna; Khalturinsky, Nikolai Alexandrovich; Berlin, Alexandr Alexandrovich; Vilesova, Marina Sergeevna; Bosenko, Margarita Serafimovna; Voronkova, Ljudmila Ivanovna (Isle Firestop Ltd., UK). PCT Int. Appl. WO 2000014152 A1 20000316, 22 pp. DESIGNATED STATES: W: AL, AM, AU, BB, BR, CA, CN, CZ, EE, FI, GE, HU, IS, JP, KE, KG, KP, KR, LK, LR, LS, LT, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, RO, RU, SD, SG, SI, SK, TR, TT, UA, UG, US, UZ, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (Russian). CODEN: PIXXD2. APPLICATION: WO 1998-RU289 19980908.

AB The fire retardant consists of a complex comprising an ammonium salt of a C1-3-alkylphosphonamide as well as NH4Cl. Methods for producing safer forms of various polymeric materials using this fire retardant, preferably in microencapsulated form, are also provided.

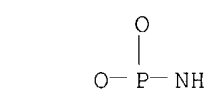
IC ICM C08K005-5399
ICS C08K009-10; C09K021-14; C08L009-00; C08L011-00; C08L013-00;

C08L019-00; C08L021-00; C08L023-04; C08L023-10; C08L025-04;
C08L063-00; C08L067-00; C08J005-24; C07F009-44
CC 37-6 (Plastics Manufacture and Processing)
IT **14500-78-8D**, Phosphonamidic acid, P-(C1-3 **alkyl**) deriv., ammonium salt, compd. with ammonium chloride
RL: MOA (Modifier or additive use); USES (Uses)
(fire retardant for polymeric materials)
IT **14500-78-8D**, Phosphonamidic acid, P-(C1-3 **alkyl**) deriv., ammonium salt, compd. with ammonium chloride
RL: MOA (Modifier or additive use); USES (Uses)
(fire retardant for polymeric materials)
RN 14500-78-8 HCA
CN Phosphonamidic acid (8CI, 9CI) (CA INDEX NAME)



*** FRAGMENT DIAGRAM IS INCOMPLETE ***

L33 ANSWER 2 OF 2 HCA COPYRIGHT 2003 ACS
105:134153 o-Alkyl-N,N-dialkylamidoarylphosphonates. Nikitin, E. V.; Romakhin, A. S.; Parakin, O. V.; Khaliullin, R. R.; Kargin, Yu. M.; Romanov, G. V.; Kosachev, I. P.; Pudovik, A. N. (Kazan State University, USSR; Arbuzov, A. E., Institute of Organic and Physical Chemistry). U.S.S.R. SU 1032769 A1 19860323 From: Otkrytiya, Izobret. 1986, (11), 262. (Russian). CODEN: URXXAF. APPLICATION: SU 1981-3363931 19811215.
AB Phosphonates ROP(O)R2NR12 (I, R, R1 = lower alkyl; R2 = tolyl, thienyl, furyl, naphthyl) are prepd. by electrochem. oxidn. of O,O'-dialkyl-N,N-dialkylamidophosphite on a Pt electrode in MeCN in the presence of 5-10 fold excess of the corresponding arom. compd. R2H, NaClO4, and Na3PO4 at room temp. in an inert gas atm. with subsequent treatment of the resulting reaction mixt. with NaI and KSCN.
IC ICM C07F009-40
ICS C07F009-44
CC 29-7 (Organometallic and Organometalloidal Compounds)
IT **14500-78-8DP**, aryl or heterocyclic, **alkyl** derivs and esters
RL: SPN (Synthetic preparation); PREP (Preparation)
(prepn. of, electrochem. oxidn. of phosphites for)
IT **14500-78-8DP**, aryl or heterocyclic, **alkyl** derivs and esters
RL: SPN (Synthetic preparation); PREP (Preparation)
(prepn. of, electrochem. oxidn. of phosphites for)
RN 14500-78-8 HCA
CN Phosphonamidic acid (8CI, 9CI) (CA INDEX NAME)



*** FRAGMENT DIAGRAM IS INCOMPLETE ***

=> d L73 1-29 ti

L73 ANSWER 1 OF 29 HCA COPYRIGHT 2003 ACS
TI Device for the extraction of electrically charged molecules

L73 ANSWER 2 OF 29 HCA COPYRIGHT 2003 ACS
TI Insoluble nanofibers of linear poly(ethylenimine) and uses

L73 ANSWER 3 OF 29 HCA COPYRIGHT 2003 ACS
TI Decontaminating and dispersion suppressing foam formulation

L73 ANSWER 4 OF 29 HCA COPYRIGHT 2003 ACS
TI **Rubber** compositions with low fire danger

L73 ANSWER 5 OF 29 HCA COPYRIGHT 2003 ACS
TI Rheological and **fireproofing** characteristics of **polyethylene** modified with a **microencapsulated fire retardant**

L73 ANSWER 6 OF 29 HCA COPYRIGHT 2003 ACS
TI **Microencapsulated fire retardants** in **polymers**

L73 ANSWER 7 OF 29 HCA COPYRIGHT 2003 ACS
TI Decreasing the combustibility of polyolefins using **microencapsulated fire retardants**

L73 ANSWER 8 OF 29 HCA COPYRIGHT 2003 ACS
TI **Microencapsulated fire retardants** for polyolefins

L73 ANSWER 9 OF 29 HCA COPYRIGHT 2003 ACS
TI Decreasing the combustibility of polycaproamide and poly(ethylene terephthalate) introducing **polymer microencapsulated fireproofing** agents

L73 ANSWER 10 OF 29 HCA COPYRIGHT 2003 ACS
TI **Fireproofing polyethylene** and polypropylene

L73 ANSWER 11 OF 29 HCA COPYRIGHT 2003 ACS
TI Manufacture of ammonium polyphosphate having smooth surface for **flame retardant** in synthetic **resins**

L73 ANSWER 12 OF 29 HCA COPYRIGHT 2003 ACS
TI Effect of a phosphorus- and nitrogen-containing **fire retardant** on the thermal decomposition of poly(ethylene terephthalate)

L73 ANSWER 13 OF 29 HCA COPYRIGHT 2003 ACS
TI Determination of **polymer**-solvent interaction parameters using piezoelectric crystals, with reference to the sorption of chemical warfare agents

L73 ANSWER 14 OF 29 HCA COPYRIGHT 2003 ACS
TI Use of solid-phase extraction in determination of chemical warfare agents. Part II. Determination of chemical warfare agents in samples from a battlefield environment

L73 ANSWER 15 OF 29 HCA COPYRIGHT 2003 ACS
TI Efficacy of an oximate-based skin decontaminant against organophosphate nerve agents determined in vivo and in vitro

L73 ANSWER 16 OF 29 HCA COPYRIGHT 2003 ACS
TI **Inhibition** of cellulose **combustion** of

phosphorus-containing compounds. 2. Phosphorus-nitrogen synergism in the presence of organic amides and amines

L73 ANSWER 17 OF 29 HCA COPYRIGHT 2003 ACS
TI Ethylene-propylene-diene **rubber**-based vulcanizate

L73 ANSWER 18 OF 29 HCA COPYRIGHT 2003 ACS
TI Preparation of carbodiimides and polycarbodiimides by the decarboxylation of isocyanates in the presence of organophosphorus compounds

L73 ANSWER 19 OF 29 HCA COPYRIGHT 2003 ACS
TI **Flame-resistant** polyester fibers

L73 ANSWER 20 OF 29 HCA COPYRIGHT 2003 ACS
TI Radical copolymerization of monovinyl derivatives of phosphorus

L73 ANSWER 21 OF 29 HCA COPYRIGHT 2003 ACS
TI Nitrogen- and phosphorus-containing compounds

L73 ANSWER 22 OF 29 HCA COPYRIGHT 2003 ACS
TI **Polymers** and **copolymers** of divinylphosphinates

L73 ANSWER 23 OF 29 HCA COPYRIGHT 2003 ACS
TI Latex flow stimulation by phosphonates

L73 ANSWER 24 OF 29 HCA COPYRIGHT 2003 ACS
TI Polymerization and copolymerization of divinylphosphinic acid derivatives

L73 ANSWER 25 OF 29 HCA COPYRIGHT 2003 ACS
TI Cobalt-amide-aluminum catalyst for sterospecific manufacture of trans-pentadiene **rubber**

L73 ANSWER 26 OF 29 HCA COPYRIGHT 2003 ACS
TI Metalloid azides

L73 ANSWER 27 OF 29 HCA COPYRIGHT 2003 ACS
TI Decontaminating solution

L73 ANSWER 28 OF 29 HCA COPYRIGHT 2003 ACS
TI Organophosphorus **polymers** with P-N bonds

L73 ANSWER 29 OF 29 HCA COPYRIGHT 2003 ACS
TI .alpha.- and .beta.-Diamidophosphonoacrylates and their **polymers**

***************Joseph,

I tried to give you the most relevant results first, followed by the balance.

X

=> d L73 4-12,17,19 cbib abs hitind hitstr

NOT A complete with Ammonium Chloride

L73 ANSWER 4 OF 29 HCA COPYRIGHT 2003 ACS
131:215511 **Rubber** compositions with low fire danger. Piskarev, I. M.; Noskov, V. K.; Pomeshchikov, V. I. (NIIYaF, MGU, Moscow, Russia). Plasticheskie Massy (9), 32-34 (Russian) 1998. CODEN: PLMSAI. ISSN: 0554-2901. Publisher: ZAO NP "Plasticheskie Massy".
AB Thermal anal. of SKS-30 ARKP and SKI-3 **rubbers** filled with carbon black and contg. reactive **fireproofing** agents was carried

out in N atm. in order to detn. fire proofing mechanism. **Fireproofing** agent T-2 was in in pristine form and **microencapsulated** (MIK) in in poly(vinyl ethoxy siloxane) shell. Smoke formation was also studied. Oxidative processes have no significant effect of degrdn. of **rubber** compns. at .ltoreq. 500.degree.. Introducing 20% T-2 or 20% MIK T-2 leads to decreased max degrdn. rate of the compn. at 462.degree. from 10.4 % to 7.9 and 8 %/min, resp.

CC 39-12 (Synthetic Elastomers and Natural Rubber)

ST isoprene **rubber** compn **fireproofing** phosphorus; SBR compn **fireproofing** phosphorus

IT Styrene-butadiene **rubber**, properties
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(SKS 30ARKP; **rubber** compns. with high **fire resistance**)

IT Polysiloxanes, uses
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
(ethoxy vinyl; **rubber** compns. with high **fire resistance**)

IT **Encapsulation**
(**microencapsulation**; **rubber** compns. with high **fire resistance**)

IT Isoprene **rubber**, properties
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(of cis-1,4-configuration, SKI-3; **rubber** compns. with high **fire resistance**)

IT **Fireproofing** agents
Smoke
(**rubber** compns. with high **fire resistance**)

IT Carbon black, properties
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(**rubber** compns. with high **fire resistance**)

IT **Polymer** degradation
(thermal; **rubber** compns. with high **fire resistance**)

IT 7727-37-9, Nitrogen, uses
RL: NUU (Other use, unclassified); USES (Uses)
(atmosphere; **rubber** compns. with high **fire resistance**)

IT 9003-31-0
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(isoprene **rubber**, of cis-1,4-configuration, SKI-3; **rubber** compns. with high **fire resistance**)

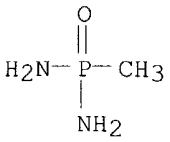
IT **4759-30-2**, T-2
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(**rubber** compns. with high **fire resistance**)

IT 9003-55-8
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(styrene-butadiene **rubber**, SKS 30ARKP; **rubber** compns. with high **fire resistance**)

IT **4759-30-2**, T-2
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(**rubber** compns. with high **fire resistance**)

RN 4759-30-2 HCA

CN Phosphonic diamide, P-methyl- (8CI, 9CI) (CA INDEX NAME)



L73 ANSWER 5 OF 29 HCA COPYRIGHT 2003 ACS
129:343993 Rheological and **fireproofing** characteristics of **polyethylene** modified with a **microencapsulated fire retardant**. Zubkova, N. S.; Butylkina, N. G.; Chekanova, S. E.; Tyuganova, M. A.; Khalturinskii, N. A.; Reshetnikov, I. S.; Naganovskii, Yu. K. (Institute of Synthetic Polymer Materials, Moscow State Textile Academy, Russian Academy of Sciences, Russia). Fibre Chemistry (Translation of Khimicheskie Volokna), 30(1), 11-13 (English) 1998. CODEN: FICYAP. ISSN: 0015-0541. Publisher: Consultants Bureau.

AB It was found that incorporation of the **microencapsulated fireproofing** compd. (MIC FC) T-2 in silicon-contg. shells in **polyethylene** does not alter the effective viscosity of the **polymer** melt at 200.degree.C. During thermolysis of PE contg. MIC FC in a poly(vinylethoxysiloxane) (PVES) shell, the max. rate of liberation of volatile compds. is 1.8 times lower than for the starting PE and is shifted to the region of a higher degree of conversion of the **polymer**, the amt. of gaseous compds. decreases, and the yield of carbonized residue (CR) increases. The fire hazard of PE modified by MIC FC T-2 in a PVES shell decreases to a greater degree than when MIC FC in a PE shell is used.

CC 37-5 (Plastics Manufacture and Processing)

ST rheol property **polyethylene microencapsulated fire retardant; fireproofing** agent **microencapsulated polyethylene** polyvinylethoxysiloxane

IT Oxygen index
(limiting; rheol. and **fireproofing** characteristics of **polyethylene** modified with **microencapsulated** methylphosphonic diamide **fire retardant**)

IT **Fireproofing**
Fireproofing agents
Thermal stability
(rheol. and **fireproofing** characteristics of **polyethylene** modified with **microencapsulated** methylphosphonic diamide **fire retardant**)

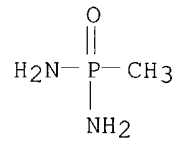
IT **Polymer** blends
Silsesquioxanes
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(rheol. and **fireproofing** characteristics of **polyethylene** modified with **microencapsulated** methylphosphonic diamide **fire retardant**)

IT **4759-30-2**
RL: MOA (Modifier or additive use); USES (Uses)
(**fireproofing** agents; rheol. and **fireproofing** characteristics of **polyethylene** modified with **microencapsulated** methylphosphonic diamide **fire retardant**)

IT **9002-88-4, Polyethylene** 29434-25-1, Poly(vinyltriethoxysilane) 156430-49-8, Vinyltriethoxysilane **homopolymer**, ladder sru
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(rheol. and **fireproofing** characteristics of **polyethylene** modified with **microencapsulated**

methylphosphonic diamide **fire retardant**)

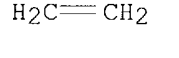
IT **4759-30-2**
RL: MOA (Modifier or additive use); USES (Uses)
(**fireproofing** agents; rheol. and **fireproofing** characteristics of **polyethylene** modified with **microencapsulated** methylphosphonic diamide **fire retardant**)
RN 4759-30-2 HCA
CN Phosphonic diamide, P-methyl- (8CI, 9CI) (CA INDEX NAME)



IT **9002-88-4, Polyethylene**
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(rheol. and **fireproofing** characteristics of **polyethylene** modified with **microencapsulated** methylphosphonic diamide **fire retardant**)
RN 9002-88-4 HCA
CN Ethene, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 74-85-1
CMF C2 H4



L73 ANSWER 6 OF 29 HCA COPYRIGHT 2003 ACS
129:317009 **Microencapsulated fire retardants** in **polymers**. Antonov, A.; Potapova, E.; Rudakova, T.; Reshetnikov, I.; Zubkova, N.; Tuganova, M.; Khalturinskij, N. (Polymer Burning Laboratory, Moscow Institute of Synthetic Polymeric Materials, Moscow, 117393, Russia). Special Publication - Royal Society of Chemistry, 224(Fire Retardancy of Polymers), 290-303 (English) 1998. CODEN: SROCDO. ISSN: 0260-6291. Publisher: Royal Society of Chemistry.
AB Efficiency of **microencapsulation** coating in preventing methylphosphonic acid diamide reaction with **polymers** during their processing was studied using polypropylene, LDPE, polycaproamide, and **polyethylene** terephthalate.
CC 37-6 (Plastics Manufacture and Processing)
ST methylphosphonic acid diamide **fire retardant** **microencapsulation**; LDPE **fireproofing** **microencapsulated** methylphosphonic acid diamide; polypropylene **fireproofing** **microencapsulated** methylphosphonic acid diamide; polycaproamide **fireproofing** **microencapsulated** methylphosphonic acid diamide; **polyethylene** terephthalate **fireproofing** **microencapsulated** methylphosphodiamide; polyvinyltriethoxysilane shell **fireproofing** agent **microencapsulation**; polymetaphenylene terephthalamide shell **fireproofing** agent **microencapsulation**
IT Polyamides, uses
RL: NUU (Other use, unclassified); USES (Uses)
(arom., **microencapsulation** shell; effect of

microencapsulation on performance of methylphosphonic acid diamide **fire retardants** in **polymers**)

IT **Fireproofing** agents
(effect of **microencapsulation** on performance of methylphosphonic acid diamide **fire retardants** in **polymers**)

IT Polyamides, uses
RL: POF (Polymer in formulation); USES (Uses)
(effect of **microencapsulation** on performance of methylphosphonic acid diamide **fire retardants** in **polymers**)

IT Polyesters, properties
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(effect of **microencapsulation** on performance of methylphosphonic acid diamide **fire retardants** in **polymers**)

IT Chars
(foamed; from **polymers** contg. **microencapsulated** methylphosphonic acid diamide **fire retardant**)

IT Carbonization
(high-temp.; of **polymers** contg. **microencapsulated** methylphosphonic acid diamide **fire retardant**)

IT Oxygen index
(limiting; of **polymers** contg. **microencapsulated** methylphosphonic acid diamide **fire retardant**)

IT Differential thermal analysis
Tensile strength
Thermogravimetric analysis
(of **polymers** contg. **microencapsulated** methylphosphonic acid diamide **fire retardant**)

IT **9002-88-4, Polyethylene**
RL: NUU (Other use, unclassified); POF (Polymer in formulation); PRP (Properties); USES (Uses)
(LDPE, also: **microencapsulation** shell; effect of **microencapsulation** on performance of methylphosphonic acid diamide **fire retardants** in **polymers**)

IT **4759-30-2**, Methylphosphonic acid diamide
RL: MOA (Modifier or additive use); USES (Uses)
(effect of **microencapsulation** on performance of methylphosphonic acid diamide **fire retardants** in **polymers**)

IT 25038-54-4, Polycaproamide, uses
RL: POF (Polymer in formulation); USES (Uses)
(effect of **microencapsulation** on performance of methylphosphonic acid diamide **fire retardants** in **polymers**)

IT 9003-07-0, Polypropylene 25038-59-9, **Polyethylene** terephthalate, properties
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(effect of **microencapsulation** on performance of methylphosphonic acid diamide **fire retardants** in **polymers**)

IT 24938-63-4, m-Phenylenediamine-terephthalic acid **copolymer**, sru
25035-36-3, m-Phenylenediamine-terephthalic acid **copolymer**
29434-25-1, Polyvinyltriethoxysilane
RL: NUU (Other use, unclassified); USES (Uses)
(**microencapsulation** shell; effect of **microencapsulation** on performance of methylphosphonic acid diamide **fire retardants** in **polymers**)

IT **9002-88-4, Polyethylene**

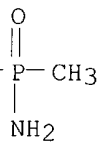
RL: NUU (Other use, unclassified); POF (Polymer in formulation); PRP (Properties); USES (Uses)
(LDPE, also: **microencapsulation** shell; effect of **microencapsulation** on performance of methylphosphonic acid diamide **fire retardants** in **polymers**)
RN 9002-88-4 HCA
CN Ethene, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 74-85-1
CMF C2 H4

$H_2C{=}CH_2$

IT **4759-30-2**, Methylphosphonic acid diamide
RL: MOA (Modifier or additive use); USES (Uses)
(effect of **microencapsulation** on performance of methylphosphonic acid diamide **fire retardants** in **polymers**)
RN 4759-30-2 HCA
CN Phosphonic diamide, P-methyl- (8CI, 9CI) (CA INDEX NAME)



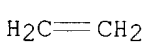
NOT A complex with Ammonium Chloride

L73 ANSWER 7 OF 29 HCA COPYRIGHT 2003 ACS
128:89681 Decreasing the combustibility of polyolefins using **microencapsulated fire retardants**. Zubkova, N. S.; Tyuganova, M. A.; Reshetnikov, I. S.; Khalturinskii, N. A. (Moscow State Textile Academy, Institute of Synthetic Polymer Materials, Russian Academy of Sciences, Russia). Fibre Chemistry (Translation of Khimicheskie Volokna), Volume Date 1997, 29(3), 166-168 (English) 1998. CODEN: FICYAP. ISSN: 0015-0541. Publisher: Consultants Bureau.
AB A method of decreasing the combustibility of polyolefins by incorporation of **microencapsulated fire retardants** (ME FR) in the **polymer** melt was developed. PE and PP contg. ME FR in PE and polyvinyltriethoxysilane (PVTES) shells belong to the category of difficult to burn materials. The study of the thermophys. and physicochem. characteristics of modified PE and PP demonstrated the major possibility of realization of the method for fabrication of polyolefins with a low fire hazard.
CC 38-3 (Plastics Fabrication and Uses)
ST **combustibility** polyolefin **microencapsulated fire retardant**; phosphonamidic acid **fireproofing** agent **microencapsulated**
IT Flammability
Fusion enthalpy
(decreasing the combustibility of polyolefins using **microencapsulated fire retardants**)
IT **Fireproofing** agents
(**microencapsulated**; decreasing the combustibility of polyolefins using **microencapsulated fire retardants**)

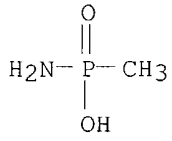
IT **Encapsulation**
(**microencapsulation**; decreasing the combustibility of polyolefins using **microencapsulated fire retardants**)
IT **Polymer** degradation
(thermal; decreasing the combustibility of polyolefins using **microencapsulated fire retardants**)
IT **9002-88-4, Polyethylene** 25722-33-2, Poly(p-xylylene)
29434-25-1, Polyvinyltriethoxysilane
RL: MOA (Modifier or additive use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(decreasing the combustibility of polyolefins using **microencapsulated fire retardants**)
IT 9003-07-0, Polypropylene
RL: PRP (Properties)
(decreasing the combustibility of polyolefins using **microencapsulated fire retardants**)
IT **106912-93-0**
RL: MOA (Modifier or additive use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(**microencapsulated**; decreasing the combustibility of polyolefins using **microencapsulated fire retardants**)
IT **9002-88-4, Polyethylene**
RL: MOA (Modifier or additive use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(decreasing the combustibility of polyolefins using **microencapsulated fire retardants**)
RN 9002-88-4 HCA
CN Ethene, homopolymer (9CI) (CA INDEX NAME)

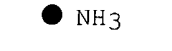
CM 1

CRN 74-85-1
CMF C2 H4



IT **106912-93-0**
RL: MOA (Modifier or additive use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(**microencapsulated**; decreasing the combustibility of polyolefins using **microencapsulated fire retardants**)
RN 106912-93-0 HCA
CN Phosphonamidic acid, P-methyl-, monoammonium salt (9CI) (CA INDEX NAME)





L73 ANSWER 8 OF 29 HCA COPYRIGHT 2003 ACS
128:89550 **Microencapsulated fire retardants** for polyolefins. Reshetnikov, Igor S.; Zubkova, Nina S.; Antonov, Alexei V.; Potapova, Elena V.; Svistunov, Victor S.; Tuganova, Margarita A.; Khalturinskij, Nikolai A. (Polymer Burning Laboratory, Moscow Institute of Synthetic Polymeric Materials, Moscow, 117393, Russia). Materials Chemistry and Physics, 52(1), 78-82 (English) 1998. CODEN: MCHPDR. ISSN: 0254-0584. Publisher: Elsevier Science S.A..

AB The action of various types of **microencapsulated fire retardants** in polyolefins has been studied. The **fire retardant** on the base of diamide of methylphosphonic acid (DAPA) can be used for common purposes. However, for best results it should be **microencapsulated** before hand. It allows one to process materials under the usual technol. conditions. Moreover, the choice of appropriate coating can also reduce flammability and improve thermoprotective properties of materials.

CC 37-6 (Plastics Manufacture and Processing)

ST methylphosphonic acid diamide **microencapsulated fire retardant**; polyolefin flammability methylphosphonic acid diamide **microencapsulated**

IT Polyamides, uses
RL: MOA (Modifier or additive use); USES (Uses)
(arom., diamide of methylphosphonic acid **microencapsulated** with; thermoprotective properties and flammability of polyolefins contg. **microencapsulated** diamide of methylphosphonic acid **fire retardants**)

IT Polysiloxanes, uses
RL: MOA (Modifier or additive use); USES (Uses)
(diamide of methylphosphonic acid **microencapsulated** with; thermoprotective properties and flammability of polyolefins contg. **microencapsulated** diamide of methylphosphonic acid **fire retardants**)

IT **Encapsulation**
(**microencapsulation**; thermoprotective properties and flammability of polyolefins contg. **microencapsulated** diamide of methylphosphonic acid **fire retardants**)

IT **Polymer** blends
RL: PRP (Properties)
(polyolefin-**microencapsulated fire retardant**; thermoprotective properties and flammability of polyolefins contg. **microencapsulated** diamide of methylphosphonic acid **fire retardants**)

IT **Fire-resistant** materials
Flammability
Polymer degradation
(thermoprotective properties and flammability of polyolefins contg. **microencapsulated** diamide of methylphosphonic acid **fire retardants**)

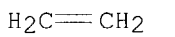
IT 29434-25-1, Vinyltriethoxysilane **homopolymer**
RL: MOA (Modifier or additive use); USES (Uses)
(crosslinked, diamide of methylphosphonic acid **microencapsulated** with; thermoprotective properties and flammability of polyolefins contg. **microencapsulated** diamide of methylphosphonic acid **fire retardants**)

IT 24938-60-1 25035-33-0, m-Benzenediamine-isophthalic acid **homopolymer**
RL: MOA (Modifier or additive use); USES (Uses)
(diamide of methylphosphonic acid **microencapsulated** with; thermoprotective properties and flammability of polyolefins contg. **microencapsulated** diamide of methylphosphonic acid **fire**

retardants)
IT 12125-02-9, Ammonium chloride, uses
RL: MOA (Modifier or additive use); USES (Uses)
(**fire retardant** contg.; thermoprotective properties and flammability of polyolefins contg. **microencapsulated** diamide of methylphosphonic acid **fire retardants**)
IT **9002-88-4, Polyethylene**
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(low-d.; thermoprotective properties and flammability of polyolefins contg. **microencapsulated** diamide of methylphosphonic acid **fire retardants**)
IT **4759-30-2**, Methylphosphonic diamide
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(thermoprotective properties and flammability of polyolefins contg. **microencapsulated** diamide of methylphosphonic acid **fire retardants**)
IT 9003-07-0, Polypropylene
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(thermoprotective properties and flammability of polyolefins contg. **microencapsulated** diamide of methylphosphonic acid **fire retardants**)
IT **9002-88-4, Polyethylene**
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(low-d.; thermoprotective properties and flammability of polyolefins contg. **microencapsulated** diamide of methylphosphonic acid **fire retardants**)
RN 9002-88-4 HCA
CN Ethene, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 74-85-1
CMF C2 H4



IT **4759-30-2**, Methylphosphonic diamide
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(thermoprotective properties and flammability of polyolefins contg. **microencapsulated** diamide of methylphosphonic acid **fire retardants**)
RN 4759-30-2 HCA
CN Phosphonic diamide, P-methyl- (8CI, 9CI) (CA INDEX NAME)

L73 ANSWER 9 OF 29 HCA COPYRIGHT 2003 ACS
128:49351 Decreasing the combustibility of polycaproamide and poly(ethylene terephthalate) introducing **polymer microencapsulated fireproofing** agents. Zubkova, N. S.; Tyuganova, M. A.; Borovkov, N. Yu.; Moryganov, A. P. (Russia). Khimicheskie Volokna (5), 40-43 (Russian) 1995. CODEN: KVLKA4. ISSN: 0023-1118. Publisher: Khimicheskie Volokna.

AB In order to decrease combustibility of polycaproamide and poly(ethylene terephthalate) fibers and retain their phys. properties, antipyrene T-2 was **microencapsulated** in arom. polyamide and introduced in **polymer** melts. **Polymers** used for **microencapsulation** were poly(m-phenyleneisophthalamide) and poly(p-phenyleneterephthalamide). Synergistic **fireproofing** effect was obsd. at the 6-10% content of the **microencapsulating polymers**. Thermooxidative degrdn. of polycaproamide and poly(ethylene terephthalate) was studied.

CC 40-4 (Textiles and Fibers)
Section cross-reference(s): 38

ST combustibility polycaproamide fiber **microencapsulated fireproofing** agent; **polyethylene** terephthalate fiber **microencapsulated fireproofing** agent; polyester fiber polyamide **microencapsulated fireproofing** agent; acrylamide fiber polyamide **microencapsulated fireproofing** agent

IT Synthetic **polymeric** fibers, properties
RL: PRP (Properties)
(acrylamide; decreasing the combustibility of polycaproamide and poly(ethylene terephthalate) fibers introducing polyamide **microencapsulated fireproofing** agents)

IT Particle size
(decreasing the combustibility of polycaproamide and poly(ethylene terephthalate) fibers introducing polyamide **microencapsulated fireproofing** agents)

IT Polyester fibers, properties
RL: PRP (Properties)
(decreasing the combustibility of polycaproamide and poly(ethylene terephthalate) fibers introducing polyamide **microencapsulated fireproofing** agents)

IT **Fireproofing** agents
Polyamides, uses
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(decreasing the combustibility of polycaproamide and poly(ethylene terephthalate) fibers introducing polyamide **microencapsulated fireproofing** agents)

IT Polyesters, properties
RL: PRP (Properties)
(fiber; decreasing the combustibility of polycaproamide and poly(ethylene terephthalate) fibers introducing polyamide **microencapsulated fireproofing** agents)

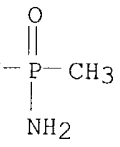
IT **Polymer** degradation
(thermooxidative; decreasing the combustibility of polycaproamide and poly(ethylene terephthalate) fibers introducing polyamide **microencapsulated fireproofing** agents)

IT **4759-30-2**, Antipyrene T 2
RL: MOA (Modifier or additive use); USES (Uses)
(decreasing the combustibility of polycaproamide and poly(ethylene terephthalate) fibers introducing polyamide **microencapsulated fireproofing** agents)

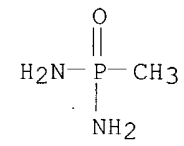
IT 24938-60-1 24938-64-5, Poly(p-phenyleneterephthalamide) 25035-33-0 25035-37-4, Poly(p-phenyleneterephthalamide)
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(decreasing the combustibility of polycaproamide and poly(ethylene terephthalate) fibers introducing polyamide **microencapsulated fireproofing** agents)

IT 9003-05-8, Polyacrylamide 25038-59-9, Poly(ethylene terephthalate),

properties
RL: PRP (Properties)
(fiber; decreasing the combustibility of polycaproamide and poly(ethylene terephthalate) fibers introducing polyamide **microencapsulated fireproofing** agents)
IT **4759-30-2**, Antipyrene T 2
RL: MOA (Modifier or additive use); USES (Uses)
(decreasing the combustibility of polycaproamide and poly(ethylene terephthalate) fibers introducing polyamide **microencapsulated fireproofing** agents)
RN 4759-30-2 HCA
CN Phosphonic diamide, P-methyl- (8CI, 9CI) (CA INDEX NAME)



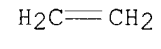
L73 ANSWER 10 OF 29 HCA COPYRIGHT 2003 ACS
128:4393 **Fireproofing polyethylene** and polypropylene.
Zubkova, N. S.; Tyuganova, M. A.; Butylkina, N. G.; Khalturinskii, N. A.; Reshetnikov, I. S.; Potapova, E. V.; Vilesova, M. S.; Voronkova, L. I.; Bosenko, M. S. (Russia). Plasticheskie Massy (5), 35-37 (Russian) 1996. CODEN: PLMSAI. ISSN: 0554-2901. Publisher: NPAOZT "Plastmassy".
AB Thermal properties of **fireproofing** compns. of **polyethylene** and polypropylene contg. Antipyrene T-2 **microencapsulated** in **polyethylene** and polyvinyltriethoxysilane were studied. Thermal effects of thermal decompn. and thermophys. characteristics near m.p. were detd.
CC 38-3 (Plastics Fabrication and Uses)
ST **fireproofing polyethylene** polypropylene compn
IT **Polymer** degradation
(dehydrochlorination, thermal; **fireproofing** compns. of **polyethylene** and polypropylene)
IT **Fireproofing** agents
(**fireproofing** compns. of **polyethylene** and polypropylene)
IT Polysilanes
RL: MSC (Miscellaneous); NUU (Other use, unclassified); USES (Uses)
(**fireproofing** compns. of **polyethylene** and polypropylene)
IT 29434-25-1, Poly(vinyltriethoxysilane)
RL: MSC (Miscellaneous); NUU (Other use, unclassified); USES (Uses)
(**fireproofing** compns. of **polyethylene** and polypropylene)
IT **4759-30-2**, Antipyrene T-2 **9002-88-4**, **Polyethylene** 9003-07-0, Polypropylene
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(**fireproofing** compns. of **polyethylene** and polypropylene)
IT **4759-30-2**, Antipyrene T-2 **9002-88-4**, **Polyethylene**
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(**fireproofing** compns. of **polyethylene** and polypropylene)
RN 4759-30-2 HCA
CN Phosphonic diamide, P-methyl- (8CI, 9CI) (CA INDEX NAME)



RN 9002-88-4 HCA
CN Ethene, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 74-85-1
CMF C2 H4



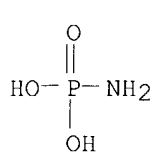
L73 ANSWER 11 OF 29 HCA COPYRIGHT 2003 ACS
125:118887 Manufacture of ammonium polyphosphate having smooth surface for **flame retardant** in synthetic **resins**.
Watanabe, Makoto (Chisso Corp., Japan). Eur. Pat. Appl. EP 721918 A2 19960717, 8 pp. DESIGNATED STATES: R: DE, FR, GB, IT. (English). CODEN: EPXXDW. APPLICATION: EP 1995-120065 19951219. PRIORITY: JP 1995-20932 19950112.

AB A process for manufg. of ammonium polyphosphate comprises heating a mixt. of a phosphate-contg. substance and a condensation agent in an ammoniacal wet air atm. in the presence of ammonium polyphosphate seed crystals. The phosphate-contg. substance is selected from ammonium dihydrogen phosphate, diammonium hydrogen phosphate, triammonium phosphate, monoammonium amidophosphate, diammonium amidophosphate, urea phosphate, and low condensates of either phosphoric acid or ammonium phosphate. The products have smooth surface and are used as **flame retardant** in synthetic **resins**.

IC ICM C01B025-40
CC 49-8 (Industrial Inorganic Chemicals)
ST ammonium polyphosphate **flame retardant** synthetic **resin**; phosphate condensation ammonium polyphosphate manuf
IT **Fire-resistant** materials
(manuf. of ammonium polyphosphate having smooth surface for **flame retardant** in synthetic **resins**)
IT **Polymers**, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(manuf. of ammonium polyphosphate having smooth surface for **flame retardant** in synthetic **resins**)
IT Polyphosphoric acids
RL: IMF (Industrial manufacture); PREP (Preparation)
(ammonium salts, manuf. of ammonium polyphosphate having smooth surface for **flame retardant** in synthetic **resins**)
IT 4401-74-5, Urea phosphate 7722-76-1, Ammonium dihydrogen phosphate 7783-28-0, Diammonium hydrogen phosphate 10361-65-6, Triammonium phosphate **13566-20-6 18299-52-0**
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(manuf. of ammonium polyphosphate having smooth surface for **flame retardant** in synthetic **resins**)
IT **13566-20-6 18299-52-0**
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT

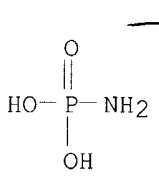
(Reactant or reagent); USES (Uses)
(manuf. of ammonium polyphosphate having smooth surface for **flame retardant** in synthetic **resins**)

RN 13566-20-6 HCA
CN Phosphoramidic acid, monoammonium salt (8CI, 9CI) (CA INDEX NAME)



● NH_3

RN 18299-52-0 HCA
CN Phosphoramidic acid, diammonium salt (8CI, 9CI) (CA INDEX NAME)



● 2 NH_3

L73 ANSWER 12 OF 29 HCA COPYRIGHT 2003 ACS
122:162801 Effect of a phosphorus- and nitrogen-containing **fire retardant** on the thermal decomposition of poly(ethylene terephthalate). Zubkova, N. S.; Tyuganova, M. A.; Nazarova, N. I.; Duderov, N. G. (Mosk. Gos. Tekstil'n. Akad., Russia). Khimicheskie Volokna (1), 31-3 (Russian) 1994. CODEN: KVLKA4. ISSN: 0023-1118. Publisher: Khimicheskie Volokna.

AB **Fire-retardant** agent T-2 (mixt. of ammonium methylphosphonic acid diamide and ammonium chloride) in poly(ethylene terephthalate) (I) led to increased oxidative stability of carbonized residue and decreased flammability of I.

CC 38-3 (Plastics Fabrication and Uses)

ST **fire retardant polyethylene** terephthalate; nitrogen phosphorus contg **fire retardant**

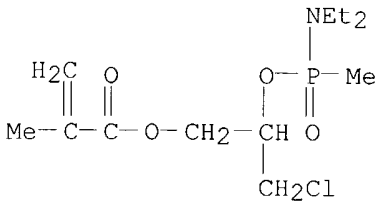
IT **Fire-resistant** materials
(effect of a phosphorus- and nitrogen-contg. **fire retardant** on the thermal decompn. of poly(ethylene terephthalate))

IT **4759-30-2**, Antipyrene t2
RL: MOA (Modifier or additive use); USES (Uses)
(effect of a phosphorus- and nitrogen-contg. **fire retardant** on the thermal decompn. of poly(ethylene terephthalate))

IT 25038-59-9, Poly(ethylene terephthalate), properties
RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)
(effect of a phosphorus- and nitrogen-contg. **fire retardant** on the thermal decompn. of poly(ethylene terephthalate))

IT **4759-30-2**, Antipyrene t2
RL: MOA (Modifier or additive use); USES (Uses)
(effect of a phosphorus- and nitrogen-contg. **fire retardant** on the thermal decompn. of poly(ethylene terephthalate))
RN 4759-30-2 HCA
CN Phosphonic diamide, P-methyl- (8CI, 9CI) (CA INDEX NAME)

L73 ANSWER 17 OF 29 HCA COPYRIGHT 2003 ACS
103:7623 Ethylene-propylene-diene **rubber**-based vulcanizate. Ogrel, A. M.; Kablov, V. F.; Malyshev, S. Yu.; Khardin, A. P.; Kargin, Yu. N.; Kubantsev, S. B. (Volgograd Polytechnic Institute, USSR). U.S.S.R. SU 1142487 A1 19850228 From: Otkrytiya, Izobret. 1985, (8), 98. (Russian). CODEN: URXXAF. APPLICATION: SU 1983-3604483 19830615.
AB Use of 2.1-6.69% of .beta.-(methacryloyloxy)-.alpha.-(chloromethyl)ethyl (diethylamido)methylphosphonate [**96840-65-2**] in a vulcanizate contg. EPDM **rubber** 66.8-70, S 1.67-1.75, Captax 0.33-0.35, thiuram 0.86-0.91, ZnO 3.34-3.5, stearic acid 1.33-1.4, triethanolamine 0.26-0.28, aerosil 13.36-14 and alkylbenzene oil 5.34-5.6% increases the fatigue strength of the vulcanizate while preserving its satisfactory deformation-resistant properties.
IC ICM C08L023-16
ICS C08K005-53
CC 39-9 (Synthetic Elastomers and Natural Rubber)
IT **Rubber**, synthetic
RL: PRP (Properties)
(EPDM, fatigue strength of, contg. (methacryloyloxy)(chloromethyl)ethyl diethylamidomethylphosphonate)
IT **96840-65-2**
RL: USES (Uses)
(EPDM **rubber** contg., for improved fatigue strength)
IT **96840-65-2**
RL: USES (Uses)
(EPDM **rubber** contg., for improved fatigue strength)
RN 96840-65-2 HCA
CN 2-Propenoic acid, 2-methyl-, 3-chloro-2-[[(diethylamino)methylphosphinyl]oxy]propyl ester (9CI) (CA INDEX NAME)



L73 ANSWER 19 OF 29 HCA COPYRIGHT 2003 ACS
84:152062 **Flame-resistant** polyester fibers. Kataoka, Hitoshi; Kitamura, Kazuyuki; Shima, Tsukasa (Asahi Chemical Industry Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 50159540 19751224 Showa, 7 pp.

(Japanese). CODEN: JKXXAF. APPLICATION: JP 1974-68703 19740618.

AB A **flame-resistant** polyester compn. is prepd. by mixing a thermoplastic polyester with a P acid amide **polymer**. Thus, a mixt. of poly(ethylene terephthalate) (I) and 5% of a **flame retardant** [25279-96-3] obtained by treating a mixt. of hexamethylenediamine 32, Et3N 32, THF 200 parts with a soln. contg. 2.67 parts phenylphosphonic acid dichloride and 200 parts THF at room temp. for 5 hr, was dried 16 hr at 80.degree./0.1 mm, spun at 280.degree. into fibers which were drawn 320% at 150.degree. to give 75-denier/24-filament fibers with improved **flame resistance** with fibers from I alone.

IC C08L; D01F

CC 39-2 (Textiles)

ST **fireproofing** agent polyester fiber; **flame resistant** polyester fiber; **polyethylene** terephthalate fiber **fireproof**

IT **Fireproofing**
(agents for, phosphorus acid amide **polymers**, for polyester fibers)

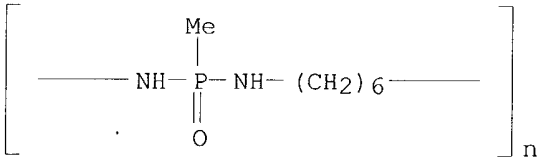
IT Polyester fibers
RL: SPN (Synthetic preparation); PREP (Preparation)
(**flame-resistant**)

IT 25190-24-3 25190-25-4 25190-26-5 25279-96-3 25279-97-4 25279-98-5 **58944-90-4** 58944-91-5 58944-92-6 58944-99-3 58945-00-9 58945-01-0
RL: USES (Uses)
(**flame retardants**, for polyester fibers)

IT **58944-90-4**
RL: USES (Uses)
(**flame retardants**, for polyester fibers)

RN 58944-90-4 HCA

CN Poly[imino(methylphosphinylidene)imino-1,6-hexanediyl] (9CI) (CA INDEX NAME)



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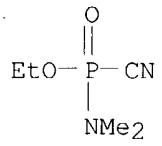
L73 ANSWER 1 OF 29 HCA COPYRIGHT 2003 ACS

136:111892 Device for the extraction of electrically charged molecules. (Alpha Technology Gesellschaft fuer Angewandte Biotechnologie Mbh, Germany). Ger. Gebrauchsmusterschrift DE 20116589 U1 20020117, 14 pp. (German). CODEN: GGXXFR. APPLICATION: DE 2001-20116589 20011010.

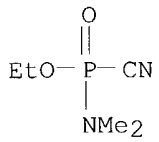
AB This device is a container which is split by a permeable sieve, filter or frit into an upper compartment to contain the sample soln., and a lower compartment which is filled with a chromatog. or electrophoretic material. The lid at the top has a septum and an electrode which protrudes into the sample soln. The lower compartment has a small container at the bottom with an electrode, to hold the sepd. mols. This electrode is covered with a cellulose membrane coating.

IC ICM G01N001-02
ICS G01N001-28; G01N027-00; C07B063-00

CC 80-4 (Organic Analytical Chemistry)
Section cross-reference(s): 9, 38, 61, 72
IT Ion exchangers
(dextran, agarose, cellulose or **polystyrene**; device for extn. of elec. charged mols.)
IT **77-81-6P**, Tabun 96-64-0P, Soman 107-44-8P, Sarin 505-60-2P, Mustard gas 50782-69-9P, VX
RL: PUR (Purification or recovery); PREP (Preparation)
(device for extn. of elec. charged mols.)
IT **77-81-6P**, Tabun
RL: PUR (Purification or recovery); PREP (Preparation)
(device for extn. of elec. charged mols.)
RN 77-81-6 HCA
CN Phosphoramidocyanidic acid, dimethyl-, ethyl ester (6CI, 8CI, 9CI) (CA INDEX NAME)



L73 ANSWER 2 OF 29 HCA COPYRIGHT 2003 ACS
134:312386 Insoluble nanofibers of linear poly(ethylenimine) and uses. Smith, Daniel; Reneker, Darrell (University of Akron, USA). PCT Int. Appl. WO 2001027368 A1 20010419, 13 pp. DESIGNATED STATES: W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 2000-US27737 20001006. PRIORITY: US 1999-PV158676 19991008.
AB Nanofibers of linear poly(ethylenimine) provide a lightwt. protective fabric capable of capturing and neutralizing chem. warfare agents, and for use in protective breathing apparatuses. Poly(ethylenimine) provides multiple amine sites for the nucleophilic decompn. of mustard gases and fluorophosphate nerve gases. Nanofibers provide a larger surface area per unit mass than traditional textile fabrics. A fabric comprising nanofibers of linear poly(ethylenimine) also provides for gas and H2O vapor permeability resulting in a more comfortable fabric.
IC ICM D03D015-00
ICS D04H001-00
CC 40-1 (Textiles and Fibers)
ST chem resistant **polyethyleneimine** fabric; electrospun **polyethyleneimine** fiber fabric
IT **77-81-6**, Tabun 96-64-0, Soman 107-44-8, Sarin
RL: MSC (Miscellaneous)
(crosslinked nanofibers of linear poly(ethylenimine) for lightwt. breathable protective fabric for decompn. of chem. warfare agents)
IT **77-81-6**, Tabun
RL: MSC (Miscellaneous)
(crosslinked nanofibers of linear poly(ethylenimine) for lightwt. breathable protective fabric for decompn. of chem. warfare agents)
RN 77-81-6 HCA
CN Phosphoramidocyanidic acid, dimethyl-, ethyl ester (6CI, 8CI, 9CI) (CA INDEX NAME)



L73 ANSWER 3 OF 29 HCA COPYRIGHT 2003 ACS
133:212251 Decontaminating and dispersion suppressing foam formulation.
Bureaux, John G.; Cowan, George R.; Cundasawmy, N. Edward; Purdon, J. Garfield (Can.). PCT Int. Appl. WO 2000051687 A1 20000908, 90 pp. DESIGNATED STATES: W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 2000-CA199 20000225. PRIORITY: US 1999-PV122091 19990226.

AB A method and foam formulation are provided for enabling both blast suppressing and decontamination, particularly desirable when faced with an explosive device which has been rigged with a contaminant for destructive dissemination. A formulation is foamed to surround the explosive chem./biol. (CB) contaminant device, preferably **encapsulated** in a containment structure. The preferred compn. of foamer-compatible decontaminant and foamer to foam and surround the device is about 1 % to 3 % /w of hydrated chloroisocyanuric acid salts and more including lithium hypochlorite, about 1 % of a co-solvent selected from the group consisting of polypropylene glycols, **polyethylene** glycols, and derivs. and mixts. thereof; about 1 % to about 5 % of a surfactant and foam stabilizer; and a buffer system to initially maintain said formulation at a pH from about 11.0 to about 8.5 for a min. of 30 min; and the balance being water.

IC ICM A62D003-00

CC 59-6 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 46, 50

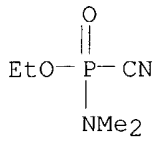
IT 25322-68-3, **Polyethylene** glycol 25322-69-4, Polypropylene glycol
RL: TEM (Technical or engineered material use); USES (Uses)
(foam co-solvent; foam formulation for blast suppression and decontamination)

IT **77-81-6** 96-64-0, GD 107-44-8, Sarin 505-60-2, Mustard 13981-28-7, Lanthanum 140, processes 50782-69-9, VX
RL: REM (Removal or disposal); PROC (Process)
(foam formulation for blast suppression and decontamination)

IT **77-81-6**
RL: REM (Removal or disposal); PROC (Process)
(foam formulation for blast suppression and decontamination)

RN 77-81-6 HCA

CN Phosphoramidocyanidic acid, dimethyl-, ethyl ester (6CI, 8CI, 9CI) (CA INDEX NAME)



L73 ANSWER 13 OF 29 HCA COPYRIGHT 2003 ACS
118:118443 Determination of **polymer**-solvent interaction parameters using piezoelectric crystals, with reference to the sorption of chemical warfare agents. Charlesworth, John M.; Riddell, Stuart Z.; Mathews, Robert J. (Mater. Res. Lab., DSTO, Ascot Vale, 3032, Australia). Journal of Applied Polymer Science, 47(4), 653-65 (English) 1993. CODEN: JAPNAB. ISSN: 0021-8995.

AB The present work illustrates some simple methods for the detn. of fundamental properties such as **polymer**-solvent interaction parameters and diffusion consts., and relates these to the sensitivity and response time of the sensor. **Polymers** with a controlled variation in crosslink d. were exposed to a variety of common solvents and vapors covering a range of soly. parameters. Seven non-crosslinked amorphous **polymeric** materials were also assessed for their suitability as selective coatings for the detection of a range of chem. warfare vapors. Gross differences in the response characteristics of coated crystals immersed in liqs. can be predicted, and an approx. guide to the relative rates of solvent penetration can also be obtained. More accurate predictions are hampered by the lack of knowledge of the specific interactions which occur within **polymer**-solvent pairs. Crosslinking the **polymer** film to enable operation in strongly solvating liqs. has the effect of reducing the extent of swelling to a larger degree than expected on the basis of existing theories. The operation of coated crystals in the gas phase at very high vapor concns. leads to a dual site adsorption process which can be described by the BET equation. At much lower vapor concns. Henry's law appears to det. the response, and a simple soln. model developed from partition theory for stationary phases in gas-liq. chromatog. can be used to interpret the sensitivity of 3 non-crosslinked amorphous **polymeric** films to DMMP, GA, GP, and GD. While adequately describing the responses of the organophosphorus esters, the model is not as satisfactory in predicting the interactions with HD.

CC 4-3 (Toxicology)

ST **polymer** solvent piezoelec crystal warfare agent; sorption chem warfare agent **polymer** solvent

IT **Rubber**, polysulfide
Siloxanes and Silicones, uses
RL: PRP (Properties)
(interaction of, with solvents, detn. of, by piezoelec. crystals, chem. warfare agents sorption in relation to)

IT Solvents
(interactions of, with **polymers**, detn. of, by piezoelec. crystals, chem. warfare agents sorption in relation to)

IT **Polymers**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(interactions of, with solvents, detn. of, by piezoelec. crystals, chem. warfare agents sorption in relation to)

IT Sorption
(of chem. warfare agents, **polymer**-solvent interactions detn. by piezoelec. crystals in relation to)

IT Chemical warfare agents

(sorption of, **polymer**-solvent interactions detn. by piezoelec. crystals in relation to)

IT **Rubber**, synthetic
RL: PRP (Properties)
(chlorosulfonated **polyethylene**, interaction of, with solvents, detn. of, by piezoelec. crystals, chem. warfare agents sorption in relation to)

IT **Rubber**, synthetic
RL: PRP (Properties)
(fluoro, interaction of, with solvents, detn. of, by piezoelec. crystals, chem. warfare agents sorption in relation to)

IT Oscillators and Resonators
(piezoelec., sensor, **polymer**-solvent interaction detn. by, chem. warfare agents sorption in relation to)

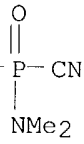
IT 67-56-1, Methanol, biological studies 67-64-1, Acetone, biological studies 67-66-3, Chloroform, biological studies 71-41-0, n-Pentanol, biological studies 75-05-8, Acetonitrile, biological studies 75-09-2, Dichloromethane, biological studies 79-20-9, Methylacetate 108-88-3, Toluene, biological studies 109-60-4, Propylacetate 123-86-4, Butylacetate 123-91-1, Dioxane, biological studies 141-78-6, Ethylacetate, biological studies
RL: PRP (Properties)
(interaction of, with **polymers**, detn. of, by piezoelec. crystals, chem. warfare agents sorption in relation to)

IT **77-81-6** 96-64-0 107-44-8 505-60-2 756-79-6
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(sorption of, **polymer**-solvent interaction detn. by piezoelec. crystals in relation to)

IT **77-81-6**
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(sorption of, **polymer**-solvent interaction detn. by piezoelec. crystals in relation to)

RN 77-81-6 HCA

CN Phosphoramidocyanidic acid, dimethyl-, ethyl ester (6CI, 8CI, 9CI) (CA INDEX NAME)



L73 ANSWER 14 OF 29 HCA COPYRIGHT 2003 ACS

115:247223 Use of solid-phase extraction in determination of chemical warfare agents. Part II. Determination of chemical warfare agents in samples from a battlefield environment. Aasulf Toernes, John; Opstad, Aase Mari; Johnsen, Bjoern Arne (Div. Environ. Toxicol., Norw. Def. Res. Establ., Kjeller, N-2007, Norway). International Journal of Environmental Analytical Chemistry, 44(4), 227-32 (English) 1991. CODEN: IJEAA3. ISSN: 0306-7319.

AB The chem. warfare agents Tabun, Sarin, Soman, VX, and mustard gas and the Sarin impurity diispropyl methylphosphonate have been isolated from different samples from a battlefield environment. 50 ML of water, 2 g of grass, soil, sand, paper, neoprene or butyl **rubber** or 1 g of silicone, a polyurethane foam with activated charcoal or a polyester/cotton fabric were spiked with either 1 mg and 1 .mu.g of the various compds. The samples were extd. with water, and the aq. soln. passed through cartridges filled with C18 sorbent. The compds. were then

eluted with chloroform and quant. analyzed by gas chromatog. with a flame ionization detector. The highest yields of the investigated compds. were obtained from water, sand, and paper and the lowest from grass, butyl **rubber**, and polyurethane foam with activated charcoal.

CC 80-6 (Organic Analytical Chemistry)
Section cross-reference(s): 4, 61

IT Urethane **polymers**, analysis
RL: ANST (Analytical study)
(cellular, chem. warfare agent detn. in battlefield activated-charcoal contg., by solid-phase extn./capillary gas chromatog.)

IT Environmental analysis
Grass
Paper
Soil analysis
Rubber, butyl, analysis
Rubber, neoprene, analysis
Sand
Siloxanes and Silicones, analysis
RL: ANST (Analytical study)
(chem. warfare agent detn. in battlefield, by solid-phase extn./capillary gas chromatog.)

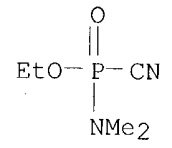
IT **77-81-6**, Tabun 96-64-0, Soman 107-44-8, Sarin 505-60-2, Bis(2-chloroethyl) sulfide 1445-75-6, Diisopropyl methylphosphonate 50782-69-9, VX
RL: ANT (Analyte); ANST (Analytical study)
(detn. of, in battlefield environmental samples by solid-phase extn./capillary gas chromatog.)

IT 9010-85-9 9010-98-4
RL: ANST (Analytical study)
(**rubber**, chem. warfare agent detn. in battlefield, by solid-phase extn./capillary gas chromatog.)

IT **77-81-6**, Tabun
RL: ANT (Analyte); ANST (Analytical study)
(detn. of, in battlefield environmental samples by solid-phase extn./capillary gas chromatog.)

RN 77-81-6 HCA

CN Phosphoramidocyanidic acid, dimethyl-, ethyl ester (6CI, 8CI, 9CI) (CA INDEX NAME)



L73 ANSWER 15 OF 29 HCA COPYRIGHT 2003 ACS

115:87007 Efficacy of an oximate-based skin decontaminant against organophosphate nerve agents determined in vivo and in vitro. Sawyer, Thomas W.; Parker, Deborah; Thomas, Norleen; Weiss, M. Tracy; Bide, Richard W. (Def. Res. Establ., Suffield/Ralston, AB, Can.). Toxicology, 67(3), 267-77 (English) 1991. CODEN: TXCYAC. ISSN: 0300-483X.

AB Recent Canadian research efforts have been directed towards the development of a reactive skin decontaminant (RSD) lotion active against classical nerve agents and mustard. The formulation presently under study consists of a 1.25 m soln. of potassium 2,3-butanedione monoximate (KBDO) in **polyethylene** glycol Me ether 550. Although this formulation has shown good efficacy, concern has been expressed as to the potential toxicity of the reaction products of KBDO and organophosphate (OP) nerve

agents. This report describes the high efficacy of this lotion in inactivating OPs as measured by the systemic toxicity of the OP/RSD mixts. in rats. In addn., primary cultures of chick embryo neurons were also used to test the efficacy of the RSD. By relating the anticholinesterase activity in these cultures of the OP/RSD mixt. to that of pure OP stds., a sensitive measure of the value of the RSD in inactivating tabun, sarin, soman and VX was obtained. Expts. with all 4 nerve agents in this in vitro system provided a good correlation with the in vivo data, and also indicated that the inactivation process was time- and agent-dependent and also related to the ratio of OP to RSD.

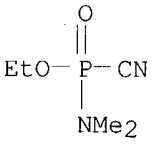
CC 4-3 (Toxicology)

IT **77-81-6**, Tabun 96-64-0, Sarin 107-44-8, Sarin 505-60-2, Mustard gas 50782-69-9, VX
RL: ADV (Adverse effect, including toxicity); BIOL (Biological study)
(toxicity of, butanedione monooximate prevention against)

IT **77-81-6**, Tabun
RL: ADV (Adverse effect, including toxicity); BIOL (Biological study)
(toxicity of, butanedione monooximate prevention against)

RN 77-81-6 HCA

CN Phosphoramidocyanidic acid, dimethyl-, ethyl ester (6CI, 8CI, 9CI) (CA INDEX NAME)



L73 ANSWER 16 OF 29 HCA COPYRIGHT 2003 ACS

106:103994 **Inhibition** of cellulose **combustion** of phosphorus-containing compounds. 2. Phosphorus-nitrogen synergism in the presence of organic amides and amines. Sultanov, M. T.; Sadykov, M. M.; Muratova, U. M.; Usmanov, Kh. U. (NII Khim. Tekhnol. Khlopk. Tsellyul., Tashkent, USSR). Koksnes Kimija (5), 30-4 (Russian) 1986. CODEN: KHDRDQ. ISSN: 0201-7474.

AB Cellulose (I) [9004-34-6] samples were soaked in P-contg. compds. [H3PO3, (NH4)2HPO4, MePO(OH)2 [993-13-5], MePO(ONH4)2 [27546-19-6], P(CH2OH)3 [2767-80-8], HPO3, MePO(NH2)2 [**4759-30-2**], and PO(NH2)3] and N-contg. compds. (urea [57-13-6], dimethylolurea [140-95-4], dimethylolethyleneurea [136-84-5], monoethanolamine [141-43-5], ethylenediamine [107-15-3], triethanolamine [102-71-6], **polyethylenepolyamine**, trimethylolmelamine [1017-56-7]), and the P-N synergism with respect to the **inhibition** of I **combustion** was studied by dielec. spectroscopy and O index. The increase of **flame resistance** of I in the presence of amide N is caused by the formation of PO(NH2)3, which is the most effective agent for I dehydration during thermal degrdn. The optimum P-N ratio is detd. by the chem. structure of the P-contg. compd. with respect to the theor. possibility of P-N bond formation. The P-N synergism in the presence of amine N is explained by formation of inactive radicals inhibiting radical processes occurring during burning. In both cases (i.e., in the presence of amine or amide), the presence of mobile H at the N atom of the N-contg. compd. is a prerequisite for improved suppression of I flammability.

CC 43-3 (Cellulose, Lignin, Paper, and Other Wood Products)

ST **fireproofing** cellulose; phosphorus nitrogen compd
fireproofing cellulose; amide phosphorus compd
fireproofing cellulose; amine phosphorus compd

fireproofing cellulose; synergism phosphorus nitrogen
fireproofing cellulose

IT Amides, uses and miscellaneous
Amines, uses and miscellaneous
RL: USES (Uses)
(**fireproofing** agents, phosphorus-contg. compds. and, for cellulose, phosphorus-nitrogen synergism in relation to)

IT **Fireproofing**
(of cellulose, with phosphorus-contg. compds. contg. org. amides or amines)

IT **Fireproofing** agents
(phosphorus-contg. compds. contg. org. amides or amines, for cellulose, phosphorus-nitrogen synergism in relation to)

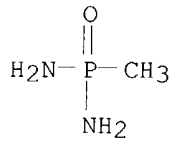
IT 993-13-5, Methylphosphonic acid 2767-80-8 **4759-30-2**, Methylphosphonic diamide 7664-38-2, Orthophosphoric acid, uses and miscellaneous 7783-28-0, Dibasic ammonium phosphate 10343-62-1, Metaphosphoric acid 13597-72-3, Phosphoric triamide 27546-19-6
RL: USES (Uses)
(**fireproofing** agents, contg. org. amides or amines, for cellulose, phosphorus-nitrogen synergism in relation to)

IT 57-13-6, Urea, uses and miscellaneous 102-71-6, Triethanolamine, uses and miscellaneous 107-15-3, Ethylenediamine, uses and miscellaneous 136-84-5, Dimethylolethyleneurea 140-95-4, Dimethylolurea 141-43-5, Monoethanolamine, uses and miscellaneous 1017-56-7, Trimethylolmelamine 36722-04-0
RL: USES (Uses)
(**fireproofing** agents, phosphorus-contg. compds. and, for cellulose, phosphorus-nitrogen synergism in relation to)

IT 9004-34-6, Cellulose, uses and miscellaneous
RL: USES (Uses)
(**fireproofing** of, with phosphorus-contg. compds. contg. org. amides or amines, phosphorus-nitrogen synergism in relation to)

IT **4759-30-2**, Methylphosphonic diamide
RL: USES (Uses)
(**fireproofing** agents, contg. org. amides or amines, for cellulose, phosphorus-nitrogen synergism in relation to)

RN 4759-30-2 HCA
CN Phosphonic diamide, P-methyl- (8CI, 9CI) (CA INDEX NAME)



L73 ANSWER 18 OF 29 HCA COPYRIGHT 2003 ACS
101:153259 Preparation of carbodiimides and polycarbodiimides by the decarboxylation of isocyanates in the presence of organophosphorus compounds. Mysin, N. I.; Fridland, S. V.; Yurkova, N. N.; Dergunov, Yu. I. (USSR). Khimicheskaya Promyshlennost (Moscow, Russian Federation) (7), 398-401 (Russian) 1984. CODEN: KPRMAW. ISSN: 0023-110X.

AB Several organophosphorus compds. are prepd. and used as catalysts in decarboxylation of isocyanates or **polymn.** of diisocyanates to give carbodiimides and polycarbodiimides, resp. The latter are evaluated as hydrolytic stabilizers of urethane **rubber**. The highest conversion of isocyanates (e.g., 83.8% for 3,4-dichlorophenyl isocyanate [102-36-3]) was achieved with 3-methyl-1-phenyl-3-phospholene oxide (I) [7564-51-4]. **Polymn.** of diisocyanates in the presence of I was

carried out by 3 different schemes, varying reaction conditions to obtain **polymers** with desired properties. Thus, 2,4-TDI was **polymd**. 7 h at 25.degree. in the suspension of I in 2,4-TDI, to give an org. solvent-sol. **polymer** having m.p. 85.degree., NCO group content 6.65%, and mol. wt. 786. This **polymer**, when added to the urethane **rubber** ESKU-50, increased the tensile strength of **rubber** after hydrolytic aging for 24 h from 140 to 270 kg/cm2.

CC 39-9 (Synthetic Elastomers and Natural Rubber)

ST phosphorus catalyst decarboxylation isocyanate; **polymn** diisocyanate phosphorus catalyst; carbodiimide urethane **rubber** hydrolysis; polycarbodiimide urethane **rubber** hydrolysis; stabilizer urethane **rubber** hydrolysis

IT **Rubber**, urethane, uses and miscellaneous
RL: SPN (Synthetic preparation); PREP (Preparation)
(hydrolylic stabilizers for, carbodiimides and polycarbodiimides, prepn. of, organophosphorus catalysts for)

IT **Polymer** degradation
(hydrolytic, of urethane **rubber**, inhibition of, with polycarbodiimides)

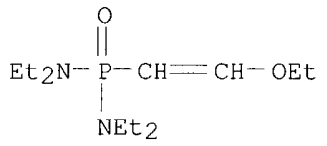
IT 762-04-9 3105-70-2 4529-76-4 7564-51-4 19016-65-0 37401-90-4 **51556-67-3** 53753-37-0 53778-28-2 92412-54-9 92412-55-0 92412-56-1 92412-57-2 **92412-58-3** 92412-59-4 **92412-60-7** 92412-61-8 92420-13-8
RL: CAT (Catalyst use); USES (Uses)
(catalysts, for decarboxylation of isocyanates and **polymn**. of diisocyanates)

IT 7778-12-3P 9017-01-0P 25686-28-6P 26006-20-2P 63105-14-6P 63875-68-3P 92412-53-8P
RL: SPN (Synthetic preparation); PREP (Preparation)
(hydrolytic stabilizers, prepn. of, organophosphorus catalysts for, for urethane **rubber**)

IT **51556-67-3 92412-58-3 92412-60-7**
RL: CAT (Catalyst use); USES (Uses)
(catalysts, for decarboxylation of isocyanates and **polymn**. of diisocyanates)

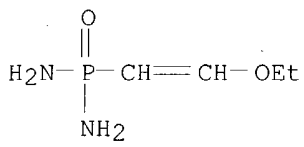
RN 51556-67-3 HCA

CN Phosphonic diamide, P-(2-ethoxyethenyl)-N,N,N',N'-tetraethyl- (9CI) (CA INDEX NAME)



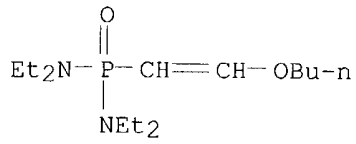
RN 92412-58-3 HCA

CN Phosphonic diamide, P-(2-ethoxyethenyl)- (9CI) (CA INDEX NAME)



RN 92412-60-7 HCA

CN Phosphonic diamide, P-(2-butoxyethenyl)-N,N,N',N'-tetraethyl- (9CI) (CA INDEX NAME)



L73 ANSWER 20 OF 29 HCA COPYRIGHT 2003 ACS
83:79696 Radical copolymerization of monovinyl derivatives of phosphorus. Levin, Yu. A.; Fridman, G. B.; Ivanov, B. E. (Inst. Org. Fiz. Khim. im. Arbuzova, Kazan, USSR). Vysokomolekulyarnye Soedineniya, Seriya A, 17(4), 845-54 (Russian) 1975. CODEN: VYSAAF. ISSN: 0507-5475.

AB Kinetic parameters were detd. for **copolymn.** of styrene (I) [100-42-5], vinyl acetate (II) [108-05-4], and Me acrylate (III) [96-33-3] with 10 P-contg. monomers (vinylphosphonates, vinyl phosphates, vinylphosphine oxides and N,N,N',N'-tetramethylvinylphosphonic diamide (IV) [**21776-17-0**] and the reactivities of the resp. compds. were evaluated. he reactivity ratios were calcd. for **copolymn.** of I and II with bis(.beta.-chloroethyl) vinylphosphonate (V) [115-98-0], dimethyl vinylphosphonate (VI) [4645-32-3], diethyl vinylphosphonate (VII) [682-30-4], diethylvinylphosphine oxide (VIII) [13172-78-6], dimethyl vinyl phosphate (IX) [10429-10-4], and diethyl vinyl phosphate (X) [4851-64-3], I with IV, III with VII, and VI with VII. The Q and e values were obtained for reactions of I with V, VI, and VII, of II with V, VI, VII, VIII, IX, and X, and of III with VII. Chain transfer consts. were obtained for **polystyrene** and poly(vinyl acetate) macroradicals to all P-contg. monomers. I was more effective in entering the **copolymer** chains than the P-contg. monomers, and the reactivity of the latter was, in general, comparable to that of II. A tendency for alteration was obsd. in the latter reaction. Except for II-IV and II-VIII systems the P-contg. monomers had moderate activity as chain transfer agents.

CC 35-4 (Synthetic High Polymers)

ST kinetics **copolymn** vinylphosphorus monomer; chain transfer vinylphosphorus **copolymn**; reactivity ratio vinylphosphorus **copolymn**; styrene vinylphosphorus monomer **copolymn**; vinyl acetate vinylphosphorus **copolymn**; methyl acrylate vinylphosphorus **copolymn**; vinylphosphonate **copolymn** kinetics; vinyl phosphate **copolymn** kinetics; vinylphosphine oxide **copolymn** kinetics; vinylphosphonic diamide **copolymn** kinetics

IT Chain transfer
(consts., in **copolymn.** of styrene and vinyl acetate with vinyl phosphates, vinylphosphine oxides and vinyl phosphates)

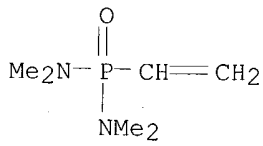
IT 96-33-3
RL: PROC (Process)
(**copolymn.** of, with diethyl vinylphosphonate)

IT 4645-32-3
RL: USES (Uses)
(**copolymn.** of, with diethyl vinylphosphonate, styrene and vinyl acetate, kinetics of)

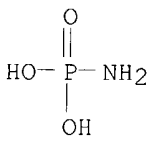
IT 682-30-4
RL: PROC (Process)
(**copolymn.** of, with dimethyl vinylphosphonate, methyl acrylate, styrene, and vinyl acetate, kinetics of)

IT 115-98-0 2096-78-8 4472-27-9 4851-64-3 10429-10-4 13172-78-6 **21776-17-0** 50687-79-1
RL: PROC (Process)

(**copolymn.** of, with styrene and vinyl acetate, kinetics of)
IT 100-42-5, reactions 108-05-4, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(**copolymn.** of, with vinyl phosphates, vinylphosphine oxides, and vinylphosphonates)
IT **21776-17-0**
RL: PROC (Process)
(**copolymn.** of, with styrene and vinyl acetate, kinetics of)
RN 21776-17-0 HCA
CN Phosphonic diamide, P-ethenyl-N,N,N',N'-tetramethyl- (9CI) (CA INDEX NAME)

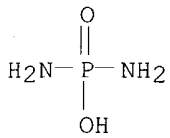


L73 ANSWER 21 OF 29 HCA COPYRIGHT 2003 ACS
80:94685 Nitrogen- and phosphorus-containing compounds. Bennett, Brian Garner; Holmes, William Samuel (Albright and Wilson Ltd.). U.S. US 3788986 19740129, 2 pp. (English). CODEN: USXXAM. APPLICATION: US 1972-288869 19720913.
AB N- and P-contg. compds., esp. compds. contg. amido phosphates, can be prepd. by a 2-stage process from liq. NH3 and solid P2O5; 1st, a dispersion of solid P2O5 in liq. NH3 is formed by adding the P2O5 to liq. NH3 with agitation so as to keep local temps. <100.degree. and then the reaction is, after completion of the addn. of P2O5, allowed to proceed at a 30-100.degree. temp. range for sufficient time to bring about the desired degree of reaction. Generally, the products have a N/P ratio of 2.4-2.6:1. They may be employed as animal feed supplements or plant-growth regulants or as intermediates in the prepn. of **flame retardant** chems.
IC C05B
NCL 252001000
CC 19-5 (Fertilizers, Soils, and Plant Nutrition)
Section cross-reference(s): 49
IT 7783-28-0P **13566-20-6P** 13597-72-3P **13597-81-4P**
RL: PREP (Preparation)
(manuf. of, two-stage)
IT **13566-20-6P 13597-81-4P**
RL: PREP (Preparation)
(manuf. of, two-stage)
RN 13566-20-6 HCA
CN Phosphoramidic acid, monoammonium salt (8CI, 9CI) (CA INDEX NAME)



RN 13597-81-4 HCA

CN Phosphorodiamidic acid, monoammonium salt (8CI, 9CI) (CA INDEX NAME)



L73 ANSWER 22 OF 29 HCA COPYRIGHT 2003 ACS
80:15256 **Polymers** and **copolymers** of divinylphosphinates.
Levin, Ya. A.; Pyrkin, R. I.; Yagfarova, T. A.; Usol'tseva, A. A. (Inst. Org. Fiz. Khim. im. Arbuzova, Kazan, USSR). Vysokomolekulyarnye Soedineniya, Seriya A, 15(9), 2070-4 (Russian) 1973. CODEN: VYSAAF. ISSN: 0507-5475.

AB Radical bulk **polymn.** of Me, Et, Pr, octyl, 2-chloroethyl, and 2-bromoethyl divinylphosphinate at 50-100.deg. gave crossliked **resins**; bulk **polymn.** of Ph divinylphosphinate or (CH2:CH)2P(O)NEt2 gave **rubbery polymers**. Poly(ethyl divinylphosphinate) [30755-15-8] obtained in benzene soln. was crosslinked, but that obtained in EtOH soln. was linear and oligomeric, apparently having been formed by cyclopolymn. In **copolymn.** of Et divinylphosphinate(I) with styrene or Me methacrylate at 70.deg. the gel fraction in the **copolymer** increased with increasing I concn., becoming complete at .leq.1:1 monomer mole ratio. I was the less reactive monomer in both **copolymns**.

CC 35-3 (Synthetic High Polymers)

ST cyclopolymn divinylphosphinate ester; crosslinking divinylphosphinate ester **polymn**; styrene **copolymn** ethyl divinylphosphinate; methacrylate **copolymn** ethyl divinylphosphinate; phosphinic amide divinyl **polymn**

IT Crosslinking
(in divinylphosphinate ester **polymn.**)

IT Ring closure and formation
(in **polymn.**, of divinylphosphinate esters)

IT 30755-16-9 30755-17-0 **30755-18-1** 50787-52-5 50787-53-6 50787-54-7 50787-55-8
RL: PRP (Properties)
(structure and properties of)

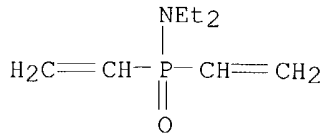
IT **30755-18-1**
RL: PRP (Properties)
(structure and properties of)

RN 30755-18-1 HCA

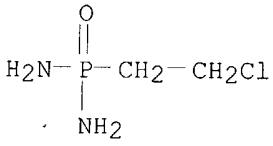
CN Phosphinic amide, P,P-diethenyl-N,N-diethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

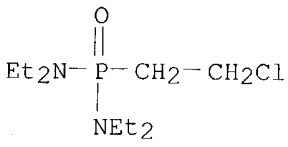
CRN 41924-82-7
CMF C8 H16 N O P



L73 ANSWER 23 OF 29 HCA COPYRIGHT 2003 ACS
80:11216 Latex flow stimulation by phosphonates. (Amchem Products Inc.). Brit. GB 1327905 19730822, 8 pp. (English). CODEN: BRXXAA. APPLICATION: GB 1972-25347 19720530.
AB (2-Bromoethyl)phosphonic acid [999-82-6] and (2-chloroethyl)phosphonic acid diamide [**33513-64-3**] increased latex flow from **rubber** trees (Hevea brasiliensis) 107% and 98%, resp., in comparison with untreated controls. The compds. were applied as 10% mixts. with palm oil at a rate of 3 ml mixt./tree.
IC A01N; C07F
CC 5-3 (Agrochemicals)
IT 999-82-6 **33513-64-3**
RL: BIOL (Biological study)
(latex flow stimulation by, in Hevea brasiliensis)
IT 5324-30-1P **14605-34-6P** 50725-29-6P
RL: SPN (Synthetic preparation); PREP (Preparation)
(prepn. of)
IT **33513-64-3**
RL: BIOL (Biological study)
(latex flow stimulation by, in Hevea brasiliensis)
RN 33513-64-3 HCA
CN Phosphonic diamide, P-(2-chloroethyl)- (8CI, 9CI) (CA INDEX NAME)



IT **14605-34-6P**
RL: SPN (Synthetic preparation); PREP (Preparation)
(prepn. of)
RN 14605-34-6 HCA
CN Phosphonic diamide, P-(2-chloroethyl)-N,N,N',N'-tetraethyl- (8CI, 9CI) (CA INDEX NAME)



L73 ANSWER 24 OF 29 HCA COPYRIGHT 2003 ACS
78:30613 Polymerization and copolymerization of divinylphosphinic acid derivatives. Pyrkin, R. I.; Levin, Ya. A.; Yagfarova, T. A.; Kovalenko, V. I.; Usol'tseva, A. A. (USSR). Mater. Nauch. Konf., Inst. Org. Fiz. Khim., Akad. Nauk SSSR, Meeting Date 1969, 200-6. Editor(s): Nesterov, L. V. Akad. Nauk SSSR, Inst. Org. Fiz. Khim.: Kazan, USSR. (Russian) 1970.

CODEN: 25XMAE.

AB Bulk **polymn.** of Et divinylphosphinate (I) [30594-15-1] proceeded analogously to that of nonconjugated diene hydrocarbons: an autocatalytic period followed by a period of autoinhibition. The conversion increased with the max. **polymn.** temp. The glass-transition temp. (Tg) of poly(Et divinylphosphinate) [30755-15-8] increased with the time of **polymn.** In **copolymn.** of I with styrene [100-42-5] or Me methacrylate [80-62-6], I was the less reactive monomer. Bulk-**polymd.** poly(Me divinylphosphinate) [30755-16-9] was similar to I **polymer** and had higher thermal stability. Poly(Ph divinylphosphinate) [30755-17-0] and poly(N,N-diethyldivinylphosphinamide) [**30755-18-1**] were **rubbery polymers** (Tg -24 and -6.deg., resp.), which retained elasticity at .leq.250.deg..

CC 36-3 (Plastics Manufacture and Processing)

ST vinylphosphinate ester **polymn**; phosphinate ester **polymn** ; polydivinylphosphinate elastomer

IT **Rubber**, synthetic
(divinylphosphinate **polymers**, glass temp. of)

IT Glass temperature and transition
(of divinylphosphinate **polymers**, **polymn.** time effect on)

IT 30755-15-8
RL: PRP (Properties)
(glass temp. of, **polymn.** time effect on)

IT 30755-17-0 **30755-18-1**
RL: USES (Uses)
(**rubbers**, glass temp. of)

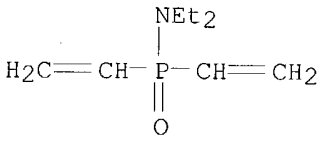
IT **30755-18-1**
RL: USES (Uses)
(**rubbers**, glass temp. of)

RN 30755-18-1 HCA

CN Phosphinic amide, P,P-diethenyl-N,N-diethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 41924-82-7
CMF C8 H16 N O P



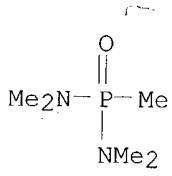
L73 ANSWER 25 OF 29 HCA COPYRIGHT 2003 ACS

76:60718 Cobalt-amide-aluminum catalyst for sterospecific manufacture of trans-pentadiene **rubber**. Guenther, Peter; Oberkirch, Wolfgang; Haas, Friedrich; Pampus, Gottfried; Marwede, Guenter (Farbenfabriken Bayer A.-G.). Ger. Offen. DE 2015153 19711021, 12 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1970-2015153 19700328.

AB The catalyst system consisted of an anhyd. Co salt, an org. amide (or ether), and ethylaluminum dichloride [563-43-9] and yielded elastomers, which gave vulcanizates of increased stability. Thus, 0.026 mmole (0.01M in C6H6) cobalt octanoate [6700-85-2] was added to 20g dry crude 1,3-pentadiene (trans isomers 84, cis isomers 15, cyclopentene 0.6, and hexane 0.3%) in 100 ml anhyd. n-heptane, followed by 3.9 mmole hexamethylphosphoric triamide [680-31-9] and 6.5 mmoles EtAlCl2 (50% in

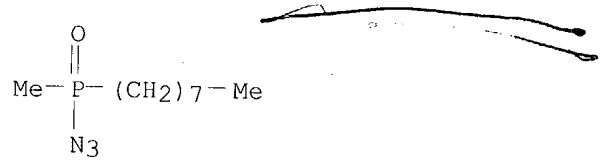
hexane) at .sim.20.deg., the mixt. **polymd.** 4 hr at 20-5.deg., and the **polymn.** terminated with a mixt. contg. iso-PrOH, Bu3N, and [5,2,3-Me(HO)(tert-Bu)C6H2]2CH2 stabilizer, to give 78% 1,2-trans-poly(1,3-pentadiene) [25212-15-1] with 97% trans double bonds. A mixt. contg. the above **polymer** 100, ZnO 3, stearic acid 3, HAF carbon black 50, aromatic plasticizer 7, Vulcacit CZ 0.5, and S 2.3 parts was vulcanized 30 min at 140.deg. and 3 kg/cm2 to give **rubber** of strength 135, 110, or 125 kg/cm2 (DIN 53,504) and elongation 420, 350, or 390% after prepn., after 10 days at 100.deg. in hot air, or after 10 days at 70.deg. and 21 atm in O, resp., as compared with 180, 60, or 100 kg/cm2 and 460, 300, or 350%, resp., for a similar com. polyisoprene **rubber.**

IC B01J; C08D
CC 38 (Elastomers, Including Natural Rubber)
ST pentadiene **rubber** stereospecific catalyst; cobalt catalyst pentadiene **rubber;** phosphoric amide hexamethyl catalyst; aluminum ethyl catalyst **rubber**
IT Amides, uses and miscellaneous
RL: USES (Uses)
(catalysts for **polymn.** of pentadiene)
IT **Rubber,** synthetic
(pentadiene, manuf. of, catalysts for)
IT 68-12-2, uses and miscellaneous 110-71-4 127-19-5 563-43-9, uses and miscellaneous 680-31-9 **2511-17-3** 5931-89-5 6700-85-2 13987-86-5 14024-48-7
RL: USES (Uses)
(catalysts for **polymn.** of pentadiene)
IT 25212-15-1P
RL: PREP (Preparation)
(of trans-1,2-configuration, **rubber,** manuf. of, catalysts for)
IT **2511-17-3**
RL: USES (Uses)
(catalysts for **polymn.** of pentadiene)
RN 2511-17-3 HCA
CN Phosphonic diamide, pentamethyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

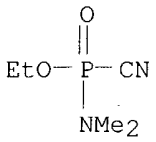


L73 ANSWER 26 OF 29 HCA COPYRIGHT 2003 ACS
64:19526 Original Reference No. 64:3601c-d Metalloid azides. Washburn, Robert M. (American Potash & Chemical Corp.). US 3212844 19651019, 3 pp. (Unavailable). APPLICATION: US 19611103.
AB Ph2POCl (1 mole) was added to a C5H5N suspension of 1 mole NaN3, the mixt. heated to reflux under Ar, filtered, and the filtrate evapd. in vacuo to give a dark yellow oil, essentially pure Ph2PON3. Ph2PSCl treated with KN3 gave Ph2PSN3. Other examples, including the prepn. of diazides and tetrazides, are given with no phys. data. These compds. are useful as blowing agents for the prepn. of various foamed materials, as insecticides, uv stabilizers, oil additives, chem. intermediates for the prepn. of phosphoranes, arsanes, and stilbenes, **rubber** vulcanizers, and stabilizers, etc. A formulation demonstrating the use of these azides as blowing agents is given.
NCL 023014000

CC 39 (Organometallic and Organometalloidal Compounds)
IT Esters
Plastics and **Resinous** products
(blowing agents for, P azides as)
IT Calcium salts
(of fatty acids, elec. charge prevention on vinyl acetatevinyl chloride **polymers** by 2-imidazoline-1-ethanol salts and)
IT 4129-17-3, Phosphinic azide, diphenyl- 4129-18-4, Phosphinic azide, di-p-tolyl- 4129-19-5, Phosphinic azide, bis(p-chlorophenyl)- 4129-20-8, Phosphinothioic azide, diphenyl- 4129-28-6, Phosphonic diazide, phenyl- 4583-37-3, Phosphinic azide, methylphenyl- **4583-38-4**, Phosphinic azide, methyloctyl- 4635-46-5, Phosphoryl azide 4635-47-6, Thiophosphoryl azide 4635-48-7, Phosphinothioic azide, bis(p-chlorophenyl)- 4635-49-8, Phosphinic azide, phenyl-p-tolyl- 4635-50-1, Phosphinothioic azide, methyloctyl- 4635-51-2, Phosphonic diazide, p-phenylenebis- 4635-52-3, Phosphinic azide, (oxydi-p-phenylene)bis[phenyl- 4635-53-4, Phosphinothioic azide, 3,3'-biphenylylenebis[phenyl- 4635-54-5, Phosphonic diazide, (oxy-p-phenylene)bis- 4639-40-1, Phosphinothioic azide, methylphenyl-
(prepn. of)
IT **4583-38-4**, Phosphinic azide, methyloctyl-
(prepn. of)
RN 4583-38-4 HCA
CN Phosphinic azide, methyloctyl- (7CI, 8CI) (CA INDEX NAME)



L73 ANSWER 27 OF 29 HCA COPYRIGHT 2003 ACS
59:11522 Original Reference No. 59:2096a-c Decontaminating solution.
Jackson, John B. (U.S. Dept. of the Army). US 3079346 19630226, 3 pp. (Unavailable). APPLICATION: US 19600504.
AB The formulation DS-2, a mixt. of diethylenetriamine, ethylene glycol monomethyl ether, and NaOH in a 70:28:2 ratio is the best of all decontaminating solns. for H and G (chem. warfare) agents. Other similar formulations contg. NaOH, 1-10%, ethylene glycol monomethyl ether 20-40%, and a primary, secondary, or tertiary amine, preferably diethylenetriamine or ethylenediamine, or a mixt. of the 2 amines 50-79%, also decontaminate these persistent agents. However, these other mixts. are not as effective as DS-2 because of poorer characteristics such as viscosity, rate of reaction, etc. DS-2 is not corrosive to steel, brass, aluminum, or magnesium, and in general it is not harmful to cotton cloth, plastics, and **rubber**; it is sprayable at temps. as low as -25.degree.F.
NCL 252153000
CC 69 (Toxicology, Air Pollution, and Industrial Hygiene)
IT **77-81-6**, Phosphoramidocyanidic acid, dimethyl-, ethyl ester 107-44-8, Phosphonofluoridic acid, methyl-, isopropyl ester
(formulation DS-2 as decontaminating agent for)
IT **77-81-6**, Phosphoramidocyanidic acid, dimethyl-, ethyl ester
(formulation DS-2 as decontaminating agent for)
RN 77-81-6 HCA
CN Phosphoramidocyanidic acid, dimethyl-, ethyl ester (6CI, 8CI, 9CI) (CA INDEX NAME)



L73 ANSWER 28 OF 29 HCA COPYRIGHT 2003 ACS
58:14972 Original Reference No. 58:2469e-f Organophosphorus **polymers** with P-N bonds. Korshak, V. V.; Krongauz, E. S.; Berlin, A. M. (Inst. Heteroorg. Compds., Moscow). Izv. Akad. Nauk SSSR, Otd. Khim. Nauk 1412-16 (Unavailable) 1962.

AB cf. Harris, et al., J. **Polymer** Sci. 35, 540(1959); Coover, et al., CA 54, 15999d; Gribov and Wu, CA 55, 15321g; Gutmann, et al., CA 55, 18639h. MePO(NEt2)2, b16 141-2.degree., n30D 1.4560, was heated with m-C6H4(NH2)2 2 hrs. at 200.degree. and 13 hrs. at 250.degree. under N and gave 50% Et2NH and a solid residue which, heated under N at 250.degree. several hrs., then in vacuo, gave yellowish solid **polymers** [NHPMe(O)NHC6H4]n, which softened at 206-20.degree. and were sol. in hot cresol. p-C6H4(NH2)2 gave a similar polyamide, m. 220-40.degree.; (CH2)6(NH2)2 gave solid **polymers** which swelled in cresol or H2O; (CH2NH2)2 gave a brittle solid which hydrolyzed in air and m. 118-20.degree.. Similar reaction with PhP(O)(NH2)2, m. 189-90.degree., gave a similar polyamide, m. 100-80.degree., which was evidently a mixt. of the desired polyamide and the selfcondensation product of the latter component. The polyamides prepd. in this work appeared to have been contaminated with low-mol.-wt. products of cyclization of the amides. Mol. wts. of the polyamides listed above were 735-3350.

CC 39 (Organometallic and Organometalloidal Compounds)

IT **Polymers**
(nitrogen- and P-contg. org.)

IT Phosphorus compounds
(nitrogen-contg., **polymers**)

IT Nitrogen compounds
(phosphorus-contg., **polymers**)

IT Phosphonic diamide, methyl-, **polyethylene**
(polyhexamethylene and polyphenylene derivs.)

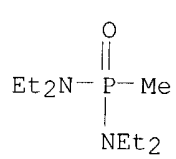
IT 4707-88-4, Phosphonic diamide, P-phenyl-
(**polymeric** derivs.)

IT **2511-18-4**, Phosphonic diamide, N,N,N',N'-tetraethyl-P-methyl-
4707-88-4, Phosphonic diamide, P-phenyl-
(prepn. of)

IT **2511-18-4**, Phosphonic diamide, N,N,N',N'-tetraethyl-P-methyl-
(prepn. of)

RN 2511-18-4 HCA

CN Phosphonic diamide, N,N,N',N'-tetraethyl-P-methyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



L73 ANSWER 29 OF 29 HCA COPYRIGHT 2003 ACS
51:79474 Original Reference No. 51:14320g-i,14321a-c .alpha.- and

.beta.-Diamidophosphonoacrylates and their **polymers**. Coover, Harry W., Jr.; Shearer, Newton H., Jr. (Eastman Kodak Co.). US 2790823 19570430 (Unavailable). APPLICATION: US .

AB A soln. of 16.4 g. ethyl N,N,N',N'-tetramethyldiamidophosphite (I), 16.5 g. methyl .alpha.-bromoacrylate (II), and 0.1 g. of hydroquinone (III) was heated at 90-110.degree. until 0.1 mole EtBr was evolved, yielding methyl .beta.-(N,N,N',N'-tetamethyldiamidophosphono)acrylate (IV), b0.5 109-12.degree.. Similarly, use of 19.2 g. ethyl N,N-diethyl-N',N'-dimethyldiamidophosphite instead of I gave methyl .beta.-(N,N-diethyl-N',N'-dimethyldiamidophosphono)acrylate (V), b0.5 131-4.degree.. Substituting 22 g. ethyl N,N,N',N'-tetraethyldiamidophosphite for I gave methyl .beta.-(N,N,N',N'-tetraethyldiamidophosphono)acrylate, b0.5 152-5.degree.. Substituting 13.6 g. ethyl N,N'-dimethyldiamidophosphite for I gave ethyl .beta.-(N,N'-dimethyldiamidophosphono)acrylate, b0.5 170-3.degree.. Reaction of I with 22.5 g. methyl .beta.-acetoxy-.alpha.-bromopropionate instead of II gave methyl .beta.-acetoxy-.alpha.-(tetramethyldiamidophosphono)propionate, which, when heated to 200.degree. with 0.6 g. KHSO3 plus 0.1 g. III released AcOH. Addn. of K2CO3 until neutral followed by distn. gave methyl .alpha.-(N,N,N',N'-tetramethyldiamidophosphono)acrylate (VI), b0.5 104-7.degree.. A mixt. of 8 g. styrene, 2 g. VI, and 0.1 g. Ac2O2 in a glass bottle under a N atm. was heated to 60.degree., yielding a clear, hard, **flame-resistant polymer** that was readily molded and sol. in C6H6 and PhCl. Similarly, 6 g. styrene, 4 g. IV, and 0.1 g. Ac2O2 gave a **flame-resistant polymer** contg. 60% by wt. styrene and 40% IV. A mixt. of 8 g. freshly distd. CH2:CHCN, 2 g. V, 1 cc. aq. 10% H2O2, and 1 cc. 6N H2SO4 was added to 90 cc. of a soln. of 0.02 g. FeSO4 in distd. H2O. Polymerization started immediately and was completed in 4-5 hrs. The mixt. was filtered, washed, and dried, giving a white solid which when dissolved in a suitable org. solvent and spun gave white, lustrous **flame-resistant** fibers. Similar copolymerizations of the diamidophosphono compds. with CH2:CHCl or CH2:CCl2 gave similar **polymers**. Incorporation of CH2:CHCH:CH2 in the polymerization mix gave a latexlike dispersion resembling natural-**rubber** latex.

CC 31 (Synthetic Resins and Plastics)

IT 1,3-Butadiene **polymers** (including **copolymers**), with diamidophosphonoacrylates
Acrylic acid, 2-[bis(dimethylamino)phosphinyl]-, **homopolymer**
Acrylic acid, 3-[(diethylamino)(dimethylamino)phosphinyl]-, **homopolymer**
Acrylic acid, 3-[bis(diethylamino)phosphinyl]-, **homopolymer**
Acrylic acid, 3-[bis(dimethylamino)phosphinyl]-, **homopolymer**
Acrylic acid, 3-[bis(methylamino)phosphinyl]-, **homopolymer**
Acrylonitrile **polymers**, with diamidophosphonoacrylates

IT Acrylic acid, 2-(diaminophosphinyl)-
Acrylic acid, 3-(diaminophosphinyl)-
(derivs., and their **polymers**)

IT **Fire-resistant** materials, **Flame-retardant** materials
(diamidophosphonoacrylate **polymers** as)

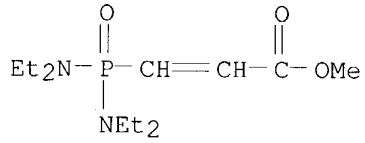
IT **108992-14-9**, Acrylic acid, 3-[bis(diethylamino)phosphinyl]-, methyl ester **114983-72-1**, Acrylic acid, 3-[(diethylamino)(dimethylamino)phosphinyl]-, methyl ester **116008-65-2**, Acrylic acid, 2-[bis(dimethylamino)phosphinyl]-, methyl ester **116008-69-6**, Acrylic acid, 3-[bis(dimethylamino)phosphinyl]-, methyl ester **118835-98-6**, Acrylic acid, 3-[bis(methylamino)phosphinyl]-, ethyl ester
(prepn. of)

IT 9002-85-1, Ethylene, 1,1-dichloro-, **polymers** 9002-86-2,

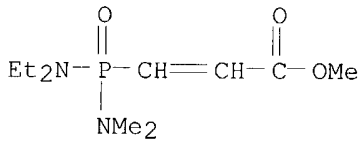
Ethylene, chloro-, **polymers**
(with diamidophosphonoacrylates)

IT **108992-14-9**, Acrylic acid, 3-[bis(diethylamino)phosphinyl]-, methyl ester **114983-72-1**, Acrylic acid, 3-[(diethylamino)(dimethylamino)phosphinyl]-, methyl ester **116008-65-2**, Acrylic acid, 2-[bis(dimethylamino)phosphinyl]-, methyl ester **116008-69-6**, Acrylic acid, 3-[bis(dimethylamino)phosphinyl]-, methyl ester **118835-98-6**, Acrylic acid, 3-[bis(methylamino)phosphinyl]-, ethyl ester
(prepn. of)

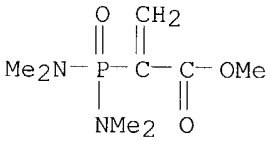
RN 108992-14-9 HCA
CN Acrylic acid, 3-[bis(diethylamino)phosphinyl]-, methyl ester (6CI) (CA INDEX NAME)



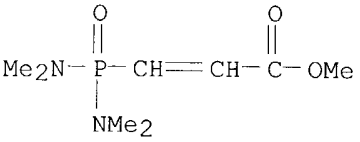
RN 114983-72-1 HCA
CN Acrylic acid, 3-[(diethylamino)(dimethylamino)phosphinyl]-, methyl ester (6CI) (CA INDEX NAME)



RN 116008-65-2 HCA
CN Acrylic acid, 2-[bis(dimethylamino)phosphinyl]-, methyl ester (6CI) (CA INDEX NAME)



RN 116008-69-6 HCA
CN Acrylic acid, 3-[bis(dimethylamino)phosphinyl]-, methyl ester (6CI) (CA INDEX NAME)



RN 118835-98-6 HCA
CN Acrylic acid, 3-[bis(methylamino)phosphinyl]-, ethyl ester (6CI) (CA INDEX NAME)